The Builder.

VOL. XLV. No. 2114. SATURDAY, AUGUST 11, 1883.

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The Effect on Architecture of Liability to Earthquakes.

THE fatal and destructive earthquake in the island of Ischia, of the magnitude of which each day brings further accounts, recalls, to those who had any experience of its effects, the yet more fatal catastrophe which desolated Calabria early in 1858. We are writing with personal experience only of the fringe of this terrible earthquake, which is said to have cost the lives of 30,000 Italians. Potenza, in the province of Basilicata, which is called the home and cradle of earthquakes, was the central point of disturbance in 1858; and the speed at which the shock travelled was estimated, after careful inquiry, at 775 ft. per second; or nearly half the velocity of sound in the air. At Naples itself but little damage was done. But this was due, rather to the solid excellence of the work of the Italian architects than to the feeble nature of the shocks, which continued through an entire night. The first was the most severe of these shocks, being followed almost immediately by the *replica*, or return shock, which is always the most dreaded part of the disturbance. Some idea of the intensity of the action at Naples may be formed from the following brief account. The writer was seated in a large saloon in a palace in Naples, which had formerly been that of the Spanish viceroys, and which is close on the shore of the bay. About nine o'clock in the evening, when some of the citizens were at the opera, the first shock came, without any premonitory symptoms. Its violence was, to some extent, to be measured by the amplitude of the oscillations of a large chandelier, depending from the ceiling, which swung through an arc of more than 90°. And as to duration, there was enough time to rise, to cross the room, and to go out on to a terrace overlooking the bay, while the noise and vibration continued. On arriving at the edge of the terrace, the observer had to cling to the railing for support, as the whole building rocked like a ship at sea. And the walls in the lowest story of the palace in question are 17 ft. thick.

The houses of Naples were emptied by the shock, the entire population, in every condition of dress and undress, pouring out into the streets, where they remained for the remainder of the night, the nobles and wealthier inhabitants sleeping in their carriages. And yet it was said that only one stone was shaken from its place in Naples. There was one point to which the natives flocked with interest on the next morning to see how far art had withstood the fierce anger of nature. It was the gate of a *porte-cochère*,—that of the Palais de Justice, if we rightly remember,—where a wide and delicate hood of masonry stretched over the gateway almost like a piece of textile work. The stone hood was uninjured.

In these regions, built on tufa, and thus in almost organic connexion with the sources of volcanic energy, the architect has to gird up his loins in order to take his part in a very serious struggle. A house in Naples is estimated to last for 100 years, undergoing in that time two pretty complete renovations. Of the solidity of the work an idea can be formed from the thickness of those 17 ft. walls of which we have spoken. They, indeed, are exceptional, but not so exceptional as might be imagined. Walls of a thickness of 3 ft. and 4 ft. in any building of considerable size, of fifty or sixty years old, are rarely undisfigured by seams which tell of past earthquakes. The Royal Palace at Caserta, a masterpiece of Vanvitelli, and built with little regard to expense, is disfigured by not a few vertical seams, which bear witness to the violence of the shocks which, at different dates rent, but could not overthrow, the noble structure. We are not aware that any such local differences in the effects of the shock were witnessed in Naples in 1858 as was the case in Lisbon in 1755, owing to the different conductive powers of different geological formations. But for the whole circle of the bay, which measures some twelve miles straight across from Naples to Sorrento, the movement of that night elevated the ground by about 8 in.,—a level which it maintained at all events for five or six years thereafter.

It is quite easy to understand how, in a locality subject to such disturbances, the normal proportions of houses are of quite another strength from those with which the English architect is familiar. And there are two or three peculiarities to which it is well to direct attention. The responsibility of the architect, or of the builder, is of a much more serious nature in Naples than with us. It extends, by common law, so as to cover maintenance for a definite time; and thus the builder, for his own sake, builds strongly. Thus brickwork, as we have it, is unknown to Naples. Most of the buildings are of stone or tufa, and when *mattone*, or brick, is used, it is in the form of the flat Roman bricks, or rather tiles, of which we have some instances in the remains of Roman work in this country, and of which the strength and durability are extraordinary. *Mattone* is more costly than the tufa generally used for internal work in Naples, and it is also considered more durable. In the third place, there is no doubt that the mortar used by the Italian builder is far better than any commonly used in England. And this is the more worthy of attention, because, as has been before noticed in the *Builder*, the principle of making mortar is contrary to that generally adopted by English engineers and architects. Probably no one in our day has studied the question of masonry more carefully than did I. K. Brunel. His designs for the bridges and other works on the Great Western, the South Wales, and other railways to which he was engineer, were exceptionally light and bold; his aim being to employ a small bulk of the very finest work, in preference to a larger bulk of ordinary work. To this end his specifications were drawn with a care that was never wearied; his great energies continually bringing out fresh editions of his normal masonry specification. The mortar was prescribed to be made with fresh slaked lime, mixed while yet hot, and any mortar not used in the course of the day in which it was mixed was to be removed from the work by the contractor. The lime was also the subject of very careful provisions.

In Southern Italy, on the contrary, the lime is slaked a year, or by preference two years, before it is made into mortar. The first thing done on commencing a building is to dig a pit into which as much lime as is thought likely to be required for the work is cast, and covered with water. It is so kept, as far as possible, under water during the whole progress of the work,—being dug out as a damp paste for mixing with sand prior to use. As to the excellence of the result there can be no manner of doubt,—any more than as to the apt and ready skill of the Italian masons, who have all the facilities at their command that we usually regard as in the province of the carpenter. The centres of arches, for example, instead of being built of wood, and lagged, are roughly and rapidly built of stone, and smoothed over with earth or clay, to receive the permanent arch stones. We have seen in a week or two after one of those local earthquakes at the foot of Mount Vesuvius,—which did much more damage in that part of Campania than did the wasted energy of the Potenza earthquake of 1858,—the cracks in the houses soldered up, the broken lintels replaced, and a large building that looked a hopeless ruin restored to a habitable condition in a few weeks, by the industry of the Italian masons. And of the confidence which this craftsman puts in his work, the excellence of the mortar no doubt is not the least determining condition.

Professor Palmieri, the seismologist, or earthquake doctor, has been writing to give his opinion that the catastrophe at Ischia was due to subterranean subsidence rather than to earthquake proper. And Mr. Mallet, M.Inst.C.E.,

who made a special study of the phenomena of the earthquake of 1858, of which we have spoken, maintains that all earthquakes are the effect of such subsidence. We cannot ourselves, having witnessed repeated earthquakes of more or less activity, subscribe to any doctrine that attributes these alarming phenomena to so simple a physical cause,—a cause, moreover, which is not only hypothetical, but not very easy to explain on its own account. That there is something of the nature of the electric shock in the earthquake, we think most physicists who have any experience of the sensation caused will hold. We desire to speak with all modesty, and that the more so from our only very recent acquaintance with the fact that electricity, as a source either of light or of motion, is now known to be convertible into heat or other forms of motion. Thus, that an internal shock, such as that produced by the fall of the roof of a great cavern, might arrive at the surface of the earth as an electric disturbance, is quite in harmony with what we know of what is now called dynamo-motor power. But then our experience of mines, tunnels, salt works, and the like, is rather opposed to the notion of any such internal cavities forming themselves under the action of water. It is possible that the different conductivity of different geological strata, of which we have witnessed with our own eyes the very evident proof that is to this day presented in the streets of Lisbon, may, if carefully studied, throw some light on this question. Subsidence is not a new phenomenon; and in cases like those of the thick coal-seam of Staffordshire, and the salt-veins and brine-pumpings of Cheshire, a much greater amount of subterranean erosion is at work than we can in any way attribute to the percolation of water in any part of the globe. But though houses are ruined, districts made bare and waste, and lakes formed by subsidence in Staffordshire and in Cheshire, we have no earthquakes there. On the other hand, to witness, after a series of shocks, whether occurring in a few minutes or extending for some days, a displacement such as that of the Bay of Naples, or the effects of the more violent local shocks which rent nearly every house at Torre del Greco, Torre Annunziata, and Resina, and that threw out a spring of hot water that ran for three weeks, betokens, we imagine, some far more violent energy than the subsidence of the roof of an unknown cavern. The terror that the earthquake causes, not in mankind alone, but in the whole animal kingdom, is a special feature of these terrific visitations. The idea that this terror is caused by any process of reasoning is one not to be entertained by any who have experienced it. That there is something akin to electricity in the shock of the earthquake is, we think, proved, among other things, by the nature of the panic instinctively caused in man and beast by even the lightest shock. In the case of an earthquake slightly felt in Wiltshire, some ten years ago, our own attention was roused by the violent terrors evinced by a pair of Australian grass parakeets. We had not noticed the shock, but we did note the time thus fixed; and on the following day the newspapers gave accounts of a shock of earthquake felt in that part of England at the precise moment indicated by the terror of the birds.

THE WEST FRONT OF ST. ALBAN'S.

As was noted in our last number, the cross at the apex of the central gable of the new west front which has been added to the Abbey was fixed a few days since, and there remained last week little more than the completion of the gable over the central porch, in front of the west window, to render the new front complete. The scaffolding, which was then still standing, though it somewhat interfered with the comprehensive view of the whole front, left room to see most parts of it well enough. We presume it is to be understood that Sir Edmund Beckett, who has defrayed the whole cost of the work, makes himself responsible for the architectural design; at least, it is publicly credited to him, and as we do not hear the name of any directing or consulting architect mentioned, he must be saddled with the architectural responsibility unless he declines it.

We regret, on every ground, to feel compelled to say that the result is fully as unsatisfactory as we from the first feared it would be. Our opinion is an entirely dispassionate one. Although thinking that Sir Edmund Beckett has on many occasions been guilty of great discourtesy towards and misrepresentation of the architectural profession, and that his own apparent opinion as to his capacity to set everybody right on matters connected with architecture is absurdly exaggerated and overweening, and has been often expressed in a manner studiously offensive to the feelings of other people, we have never denied his remarkable acquirements, nor have we taken part in the violent attacks upon him which have been made by some members of the profession in relation to this business. One or two of the latter, on the contrary, we fear, put themselves in the wrong by a want of tact and temper which they probably regretted afterwards. Nor can we be accused of having shown any bigotry in regard to the proposed alterations at the Abbey. Sir Edmund Beckett certainly could not afford to say so, as we happen to know that he directly appealed to our evidence in regard to the dilapidated and dangerous state of the old roof, in order to carry the Committee with him in deciding to have a new one. We objected to the altered pitch of the roof, as the restoration of what had long since passed out of memory, and an unnecessary disturbance of the lines of the building as they had been familiar to generations of men, and also because we foresaw from the first what has actually come to pass, viz., that the fact of the high-pitched roof being restored would be used as an argument or excuse for at once restoring the west end to correspond with it; and we had reason to fear that at this juncture such restoration would be likely to get into hands not competent to do justice to it. That something would have had to be done to it before very long, in any case, every competent witness must have seen. The anti-restoration purists who made such demonstrations about the value and beauty of the "Perpendicular" west window unquestionably talked all at random. The window was not a very valuable specimen of the style in the first instance, and it had been much patched up and knocked about, and was in a bad condition, though there was no immediate occasion for its removal. Whether, whenever the removal and renewal of the west window did become necessary, it would have been necessary or desirable to renew or restore the whole west front, is a much larger question, involving the whole subject of restoration and its artistic morality. The front had undoubtedly become a very heterogeneous collection of patchings, not without its historical interest, but entirely devoid of architectural effect or unity. One thing at least, however, was certain; that to design and build any new front in keeping with the building and in harmony with its associations was a very difficult task; that if the front was to be an original and new design, characteristic of the present time, it called for no ordinary power in architectural design; if it was to be an archæological design, professing to revive what might be presumed to have been formerly there, it required the fullest knowledge of Mediæval building and of Mediæval detail to carry out such a restoration adequately.

Upon this head, however, the legal custodians of this great building appear to have had no scruples whatever. It seems to have been sufficient to them that an influential inhabitant of the neighbourhood undertook to supply the money, and assured them that he was able to supply the brains also. Now, against any man acting as an amateur architect in the case of a new building erected for his own pleasure, we have little or nothing to say; or at least we may admit that there is little or nothing that need be said. He may produce an ugly building, which is matter for public regret certainly, but not a matter in which, unless in very extreme cases, the public can have a right to interfere; he may produce an inconveniently planned and extravagantly expensive one; but that is his own loss, and no one need trouble about it. But the case is very different with a great historic building like St. Alban's Abbey, which is a kind of national property. Surely the custodians of such a building were at least bound, in the common duty of properly discharging their trust, to have asked for some proof of a man's ability to make an important architectural addition and alteration to the building, beyond the fact of his possessing a long purse and an overweening self-confidence. What public proof had Sir Edmund Beckett given of such capacity? Absolutely none, beyond his own repeated assertions that architects were all ignorant pretenders, and that he himself knew more about the matter than any of them. In regard to practical building, we are quite ready to credit Sir E. Beckett with a good deal of the knowledge which he says he possesses; though even in regard to this branch of architecture we strongly suspect that a good deal of his claim to be listened to is rather theoretic than practical in its basis. But in regard to the archæological and artistic side of architecture there has never, so far as we know, been any claim made that he should rank as an authority; hardly even (wonderful to say) by himself, except that we believe he has incidentally asserted that he was practically the designer of one or two of Scott's leading churches, Doncaster especially. How far this is true we are in a position to know well from Scott's letters in our own possession; but in any case Sir E. Beckett has left us an unanswerable contradiction to all such claims, unfortunately, in his west front at St. Alban's. Scott carried restoration too far, and did some things with which we certainly could not sympathise; but whatever modern additions to Mediæval work he made were at least penetrated by knowledge of the style, and were in most cases as like Mediæval work as modern hands and tools could make them. The present addition to St. Alban's Abbey, on the contrary, is a coarse piece of second-rate modern Gothic, which in almost every detail shows incapacity to realise the feeling or style of the original work. The caps and other mouldings are like coarse imitations of the originals; the carving is in some places so vulgar that it is difficult to understand how any man able to carve at all could have executed the "Early English" caps, for instance, of the north-west porch, with the specimens of original caps in the interior of the porch within a few feet of him, or how any educated man could allow such work to be done in such a situation. The one fine point in the total effect is that which was inevitable from the old lines of the building,—the deep recessing of the west window between the buttresses, and the gable of the centre porch rising in front of it. This would produce a fine effect, by mere force of mass and shadow, with whatever detail. But, apart from this, the general look of the whole front may, perhaps, be best indicated by saying that it is very much the sort of Gothic which one sometimes meets with in competition designs for the larger class of Dissenting chapels,—effective, in a showy way, but totally devoid of refinement. The place of the old Perpendicular window has been taken by a badly-designed but elaborate and pretentious Early Geometric window, with details some of which are very much out of keeping, even if they were better carried out, with the predominant style of the western portion of the building. The centre porch is the best part, a deeply-recessed porch with "dog-tooth" ornament, pretty profusely used. The upper portions at each side of the centres are decorated with wall-arcading, of the former existence of which there was ample evidence in the old walls, but the work is clumsily designed and executed. The lower part of the design is the most curious and irrelevant jumble of details that could well be imagined, and which are indescribable without an illustration; the extremities of the front rise into two big turrets suggestive of "Dissenting Gothic" as aforesaid, or, perhaps, rather of what might be done in a Gothic railway-station front. To look at the quiet refined mouldings on the south side of the clearstory, and then come round to this *criard* piece of work planted on at the end, affords a contrast almost exasperating. We presume Sir E. Beckett thinks it very fine, and believes that in doing this at his own expense he has done a meritorious piece of work. If he really thinks so we can only say we are heartily sorry for him. But we can hardly have the same feeling towards those who allowed this to be done, and who seem to have thought that the mere willingness to spend his own money was sufficient to give a man who had no proper qualifications for the task a right to do as he pleased in such a case. They are very much to blame. They were responsible for the building, and if they knew no better themselves, they were bound at least to take advice from those who did. The result is that one of our greatest and most interesting buildings has had an addition made to it which is little better than vulgar, and which will be an annoyance and an amazement to future generations.

If those who are concerned in this affair think themselves aggrieved by our way of speaking of it, we shall be happy, to use a phrase once current in society, to "give them every satisfaction," in the most reasonable and practical manner, by publishing an accurate view of the front as now executed, and leave our readers to form their own judgment as to the justice of our comments. Probably the majority of them will be of opinion that our criticism was much too mild for the occasion.

A DESCRIPTION FORM FOR COMPETING ARCHITECTS.

Lamenting, as we always have, the amount of time, labour, and thought annually wasted by so many members of the architectural profession in competition drawings from which a small proportion only of the profession can be benefited; and desirous always, so far as is possible, within the lines of the apostolic limit, "as much as lieth in you," to contribute towards lightening the labours and assisting the progress of the younger and rising members of that profession especially, it has occurred to us that there is one point in which a considerable amount of labour might be saved in a perfectly legitimate manner, to the advantage of future competitors, by a very simple institution, which we will proceed briefly to describe.

The sites and the requirements of buildings may (in fact do), as every one who has given any attention to the subject will admit, vary considerably. The site for a proposed building may be of almost every conceivable mathematical or non-mathematical shape,—square, oblong, parallelogrammatic, rhomboidal, trapezoidal, cycloidal, and so on (not that we are by any means at the end of our adjectives of definition, but that, above all things, we would not be tedious), and the possibility of "permutations of *n* things" which may be placed upon each site is theoretically infinite, and practically very extended. Nor can one place any limit to the imagination of Town Councils, Committees, and other such learned bodies, in regard to the possible uses of a building site, and the amount and variety of accommodation which may be required to be arranged for on it. Hence it arrives that the shapes, dispositions, and details of competition plans are endless. But (and now we come to the point) with each set of plans it is customary for the competing victim to send a "description," sometimes called a "report," setting forth his own views about his design. Now, those whom a taste for light literature has led to the perusal of these documents must have been struck by the very prevalent similarity, both in matter and manner, which pervades them, at all events in their general statements. Nor ought we to wonder at this. The object of all such treatises is the same, viz., to persuade the committee that the particular set of plans to which it is attached is the best and most desirable for their purpose of all that have been, or that may, might, could, should, would, or ought to have been submitted; and human beings inspired by precisely similar objects are likely enough to be impelled to use very similar language. But what a waste of human labour, time, penmanship, is involved in this repetition of the same story by (in a large competition, say) fifty different scribes. Or, if the better thoughts of the ambitious competitor lead him, like Captain Grose, to "prent it," what a disproportionate expense in type-setting, even for the number required to send two copies to each member of the committee, over and above the initial labour of writing it out for the printer. Now, nearly all this labour might be avoided, and a great annual saving of time and money secured to large numbers of the profession, by the drawing up and printing, for sale by all respectable stationers, of a skeleton form embodying the main heads required in a competition report, leaving a few blanks to be filled in where any special words or statements become absolutely requisite for special cases.

Example, the proverb says, is better than precept; and, therefore, at the risk of seeming presumptuous, and subject to whatever valuable suggestions for improvement may reach us from various readers in regard to the provisions or the wording of our proposed form, we beg to subjoin a sketch for a model form, as follows:—

"*Description of the Designs submitted under the Motto* ——.

To the Chairman and Committee of ——.

Gentlemen,—In submitting for your favourable consideration the plans and designs signed ——, we can say with confidence that in regard to plan, arrangement, and practical convenience they will be found to embody in all points the requirements set forth in the instructions issued to competitors. The position of the principal rooms and departments in relation to one another, and to the external entrances, as laid down in your instructions, has been carefully attended to. Thus the —— will be found in close contiguity to the ——, and the —— offices close to the——entrance." [Here insert the names of those rooms or departments which are actually in accordance with the instructions; to insert those which are not is to waste the time of the committee, and may even be called bad manners, since, as Lord Chesterfield says, 'the whole truth should not be spoken at all times, and in all places.']

"The question of Style has received our most thoughtful consideration. Believing that —— is a town [village] with a great future before it" [strike out the word 'town' or 'village' as necessary], "we are of opinion that the union of architectural dignity and effectiveness with suitability to the requirements of modern life, and the special objects of the building will be best ensured by the adoption of the

Egyptian	Venetian Gothic
Greek	Lombard Gothic
Roman	Venetian Renaissance
Hindu	Florentine Renaissance
Ancient Peruvian	Early French Renaissance
Romanesque	Elizabethan
Byzantine	Louis XIV.
Early English	Queen Anne
Early French Gothic	Japanese
Tudor	Chinese
Mongolian	
Italian	

style" [run the pen through all except the one selected], "which has the advantage not only of being highly effective in this climate, but of being one of the most economical of all styles of architecture, and presenting a larger proportion of effective window space than any other style; while it is peculiarly suitable in the present case, owing to its harmony with [contrast to] the style of the adjacent buildings and the general architectural character of the town [village]. The advantage of such harmony [contrast] in ensuring that great desideratum, unity [variety] of architectural line and effect, will be at once appreciated.

"A glance at the plans and sections will suffice to show that every portion of the available space has been thoroughly turned to account, while the arrangement of the corridors, staircases, and entrances is such as to ensure the utmost privacy [give easy access to the public]; the various departments are all, internally, placed so as to be completely isolated from [in direct communication with] each other; an arrangement, the value and convenience of which will be at once perceived.

"It is proposed to warm the entire building by
Stoves burning smokeless fuel
Open fire-places
Steam circulation
Hot-water at low pressure
Hot-water at high pressure
Gas."

[Strike out, as before, all except the system to be selected]. "We confidently recommend this method, as at once the most effectual and economical, and that which brings the heating system more easily and completely under control than any other.

"The subject of ventilation has received the most careful attention. On this head reference is requested to the sections, on which the points of entrance and exit of air, and the direction in which it will circulate in the various apartments, are fully indicated by arrows. N.B.—More arrows can be added if thought desirable.

"The question of cost has been carefully considered, and, reckoning this at —— per cube foot, we find that the whole can be executed for —*l*. —s. —d." [The statement of the cost per cube foot, it may be observed, should always be inserted, as it gives an idea of exactitude, and shows that the estimate has not been assumed at random. It is, however, a proper and fitting concession to the susceptibilities of a building committee, not to alarm or annoy them before the time by an unnecessarily high estimate, and therefore a sum per cubic foot about 25 per cent. below the actual probable cost should be inserted in the first instance. To keep too close to the prose of mere facts in such matters shows a want of enterprise, and but for the stimulus to the imagination of building committees which is given by this poetical use of figures many successful buildings might never have come into being at all].

"In conclusion, should you do us the honour to entrust us with the commission you may rest assured that no pains and attention will be spared on our part towards completely and successfully carrying out the building.

"We are, gentlemen, your obedient servants,
"The Authors of the Design.
(Signed) ——."

Now, there is the outline of a form of "report" applicable to almost any competition, which can be printed and sold wholesale at a trifling cost, and whenever a description is wanted to accompany any competition drawings the architect will have nothing to do but just take one of these forms out of a drawer, fill up a few blanks, and strike his pen through a few words, and address it to the committee. We hope we have suggested a method which may really prove a valuable saving of time to many competitors. We retain no copyright in our idea. Any one is welcome to apply it. We are actuated only by a desire to be of use to the large number of those who risk time and labour on architectural competitions, and to shorten and simplify at least one portion of their task.

STATE RULES FOR THE BUILDING OF FRENCH SCHOOLS.

Ever since the Franco-German war the French nation has felt keenly the necessity of improved education, both mental and physical. The various Governments, which have succeeded each other in such rapid succession, have not allowed this worthy sentiment to lie dormant. In the course of seven years, from 1875 to 1882, nearly four thousand new schools were built, and much has been done to improve the establishments already in existence. At the meetings of the various scientific societies, at national and international congresses, in fact, on every possible occasion, educational questions have been raised. But in all this great anxiety was manifested not to sacrifice the body to the mind; and quite as much has been said and done with respect to the physical development of children as with respect to their ordinary education. Nor does this apply only to boys. Legislators and reformers have alike realised that the greatness and independence of France depends not only on the strength of its future soldiers, but also on the health of the mothers of future generations. Many efforts, therefore, have been made to improve the sanitary *régime* both of girls' and boys' schools. This naturally involves the great questions of light, furniture, ventilation, and drainage. Unfortunately, it is in the last-mentioned detail that the least progress is noticeable. This is a fault inherent to all French affairs, and the Ministry of Public Instruction is not specially to blame in the matter. On the contrary, this administration, instead of relying on routine and the bureaucrats in its service, boldly instituted a technical committee to draw up a set of rules which were to govern the construction of new schools.

Among the architects who formed part of this committee, we recognise the well-known names of Viollet-le-Duc and Émile Trélat. The committee was entitled *La Commission des Bâtiments Scolaires*, and was appointed by the Ministerial decree of the 17th of June, 1883. After the lapse of some time, after many discussions, inquiries, and experiments, the following were the general principles agreed upon:—

In the first place, the site selected for schools should occupy a central position. It should be situated on an open or well-aired spot, of easy and safe access; but away from all noisy, unwholesome, or dangerous factories, &c., and never nearer than 100 mètres to a cemetery. The superficial measurement of the ground should never be less than 500 mètres, and should be reckoned at the rate of not less than 10 mètres per pupil. The position of the building must be determined according to the climate and special sanitary conditions of the locality. The school must be kept apart, when, as is often the case in France, the same building is used as the Town-hall, or seat of the Municipal Council. In that case, it would be

better to hold the school on the ground floor, while the Municipal offices occupied the first floor, with a totally separate entrance. No wall built with quarry stone must be less than 40 centimètres (16 in.); and in brick, less than 35 centimètres (14 in.) in thickness. Any material of too porous a nature, such as badly-baked bricks or sandstone, must be rigorously excluded. For the roofs, slate is recommended in preference to any sort of metallic covering. Each group of scholars, boys, girls, and the very young children, must all be kept distinct, the one from the other, and no one establishment should hold more than 750 children, namely, 300 boys, 300 girls, and 150 little children in the crèche or *salle d'asile*. In no case is a class to consist of more than fifty pupils, and in schools where there are several classes the number is restricted to forty. The size of the class-rooms must allow to each pupil a minimum space of one and a quarter to one and a half square mètre, while the contents of the room must equal at least five cubic mètres for every person. Its shape should be rectangular. The *unilateral* method of lighting is to be adopted where there is sufficient light, where the proportional distance between the heights of the windows and the width of the rooms is suitable, and where there are openings on the opposite side which can be utilised to establish a thorough current of air and to admit the sun's rays in the absence of the pupils. When these conditions cannot be realised, the lights may be *bilateral*; but, though in this case, the light would be admitted on both sides, measures must be adopted so as to render the light coming from the left more intense than that admitted from the right hand side of the class-room.

The last clause in these rules will seem the most novel to the English reader. The question of admitting the light from one side only was first raised by the Society of Public Medicine and Professional Hygiene, and has been earnestly debated for more than four or five years. But the Government Commission, appointed by the decree of the 1st of June, 1881, to inquire into the causes of shortsightedness among children at school, would not discuss the rival merits of *unilateral* and *bilateral* light. They only insisted on the amount, and did not investigate the question of conflicting lights, of shadows, &c. This Commission simply decided what should be the smallest portion of sky to be seen from the least-favoured place in the class. For this purpose the eye must be placed on a level with the table, and then, measuring from the top of the window downwards, at least thirty centimètres of sky should be visible. With respect to illuminating at night, the Commission would multiply as far as possible the number of candles or lamps, but does not insist on their being placed in any particular position. The ideal would be a separate light for each desk.

With respect to the size of the windows, they should present a total surface equal to the total surface of the tables or desks. Cornices on the ceiling, where dust and germs are likely to accumulate, are not allowed; and all angles are to be abolished; the corners of the rooms rounded off. The walls are to be covered with a smooth, even substance, paint or enamel, and the wainscoting is to reach a height of about 4 ft., and should be made of wood, or some substance covered with good cement. The floors must be of hard wood, laid on some bituminous substance. The stoves employed to warm the class-rooms must have a double covering, be well protected by iron railings, and supplied with air from the outside, or in any case be so contrived as not to interfere with the ventilation.

The rules concerning drainage are altogether unworthy of our present knowledge of hygiene. For instance, the stipulated number of closets is fixed at three for the first hundred pupils and only two extra closets for each additional hundred pupils. This is even below the standard of our common lodging-houses, which harbour the dregs of the population. According to our law a closet must be provided for every twenty lodgers. Thus, twelve closets would suffice for a French school with 500 pupils, while in an English common lodging-house, containing the same number of inhabitants, there would be twenty-five closets. In size the closets must measure at least a mètre in length and 70 centimètres in width. It would be difficult to make them smaller! The seat must be of stone, the floor impermeable and slanting, so that the liquids may run to an aperture placed under the seat but giving into the pan and over its hermetically-closed valve. It is not, however, necessary to have any valve whatsoever if a ventilating shaft can be so contrived that the current of air will go downwards from the closet into the drain-pipe. These rules, though far from responding to our principles of drainage, are, nevertheless, greatly in advance of what has been done. Such a thing as a valve that can hermetically close a pan is almost unknown in France. As a rule, there is no valve, no trap, the materials fall straight down into the cesspool, and the gas generated in the cesspool, comes straight up into the closet; and we may consider the pupils fortunate if such a closet is not placed just by the side of the dormitory. As for a system of ventilation drawing off the gases, its action would not always be reliable, and such a contrivance has only been proposed in some of the newest projects.

The Society of Public Medicine issued some model regulations which are far more practical and to the purpose. These rules have not, it is true, the force of law; but as the majority of the architects, engineers, and doctors who take an active part in promoting sanitary reform belong to this society, it is to be hoped they will, of their own initiative, see that these principles are applied in all the buildings with which they are concerned. A paper on this subject had been submitted to the Society by Dr. E. R. Perrin, Member of the Commission on Unwholesome Dwellings, and Dr. Riant, Medical Officer to the École Normal of the Department of the Seine, drew up the rules in question. These were adopted and published by the Society for the guidance of all persons concerned. Among the general measures that can be immediately applied the suppression of cesspools is suggested. A movable receptacle is proposed as a substitute to the cesspool, but this must be changed very frequently. In boys' schools separate urinals, at least three for every hundred pupils, are recommended. There must be also, at least, three closets for every hundred pupils, constructed according to the regulations of the Commission, and which we have described above, excepting, however, the detail with regard to stone seats. The wooden seat and severe rules to prevent the boys standing thereon are advocated in preference. As, however, it is the universal practice in France to stand and not to sit on the seats, the best way to enforce this reform will be to imitate the system employed at the École Monge, a model high-class school in the west end of Paris. This is a very simple method. A neat wooden margin about 2 in. to 3 in. wide surrounds the rim of the pan. On this the boys are absolutely obliged to sit, for there is no broad seat on which they could stand. Closets thus constructed do not look very elegant, but are much more clean; the pan, the fittings, are all exposed to the air, and there is no place where dirt and dust can accumulate without being seen. This expedient is warmly advocated by the Society, and it also urges that a Moule earth-closet should be employed wherever a proper water-closet is impracticable. Further the Society demands that in every school an attendant should constantly watch over the closets. These measures the Society of Public Medicine insists must at once be enforced. It further advises the adoption, wherever the surrounding circumstances will permit, of the *système diviseur*. This means the use of a metallic receptacle which allows the liquids to escape to the sewer, while the solids are retained and removed once a week. Enamelled pans of hardware or of iron are recommended with an automatic hermetical valve. Also there should be a syphon to the drain pipe.

For France these are novel and useful doctrines, but there will be some difficulty in finding plumbers capable of carrying them out. The dangers of sewer-gas are only understood by a few specialists, the public at large have no knowledge whatsoever of the question, and it is never discussed by the popular papers. We fear, therefore, that it will be no easy matter to carry out even the very modest reforms proposed,—so far, at least, as drainage is concerned. In other respects, the most notable improvements have been realised; for instance, in the 20th Arrondissement of Paris, two schools, for 1,110 children, are in course of construction, according to the Tollet system. Each pupil will have 7 cubic mètres of air, and in class-rooms, measuring more that 1,000 cubic mètres, fresh air warmed to 16° C. will be pumped in at the rate of 1,500 cubic mètres per hour. Again, the Communal school in the Avenue Duquesne, built by M. Leroux, architect, and member of the Commission on Unwholesome Dwellings is a great amelioration. The land at his disposal was of a very irregular and inconvenient shape, still the result attained has given general satisfaction. In this school the closets are in the yard, thoroughly apart from the main buildings. The seats are of cement, and there is a ventilating shaft, with a gas-burner, to draw away the bad odours. At Créteil, in the suburb of Paris, there is also a model school. In this case we find, within a large garden, the boys' school, the girls' school, the crêche, the town-hall, and even the fire-engine station; yet all these services are separated from each other.

All these prescriptions apply to day-schools, and they, of course, embrace by far the largest number of scholars; but the Government Commission have also issued some rules affecting the construction of dormitories. These are generally very similar to hospital wards. At the École Monge a wooden partition separates each bed. Though this division does not reach the ceiling, still it interferes considerably with the circulation of the air and multiplies enormously the number of angles and corners where dust accumulates. For these reasons, and, perhaps, also from motives of economy, the example of the École Monge has not been followed. The Commission on School Buildings has, however, decided that the dormitories must not be very large, that in no case must they contain more than thirty beds. Windows on both sides of the dormitory must admit light and air. The floor must be of wood, the ceiling four mètres from the floor, and the width of the dormitory about 7·50 mètres. The beds should stand at least a mètre apart from each other. The Commission still adheres to the old and unwholesome French fashion of curtains. It even adds that where curtains do not hang round the beds they should be separated, as at the École Monge, by wooden partitions. This is a regulation which is diametrically opposed to all sanitary experience. A bed should stand out by itself. There should be nothing under, around, or above. Whatever air there may be in the room should have the freest possible access to the bed so as to oxidise all impurities and prevent the sleepe breathing his own breath again. It is surprising that these principles, which will be found in any elementary book on hygiene, should remain ignored by the Commission. Nevertheless, and whatever the faults and shortcomings so easily discernible in rules propounded by the Commission, there is evidently a praiseworthy effort on the part of the authorities to improve the hygiene of schools. With this is combined a notable increase in the attention paid to gymnastics, exercise, swimming, personal cleanliness, and diet. Under such circumstances there should ensue a notable amelioration in the health and physique of the rising generation in France.

ORIENTAL EXPLORATIONS.

Considerable anxiety is expressed by English Orientalists and archæologists at the present unsatisfactory state of British explorations in Western Asia. But a few years ago the two chief agencies, the Palestine Exploration Fund, and the Trustees of the British Museum, were actively engaged in their work, with full and satisfactory powers, and now neither of these are able to resume their work owing to the refusal of the Porte to grant the necessary firmans. The ignominious way in which the Palestine Exploration Fund were hurried out of Eastern Palestine last year, and the rich crop of difficulties placed in the way of Mr. Rassam about the same time, would seem to indicate that the action of the Porte in regard to these permits was largely influenced by the action of the Government in Egypt. Soon after his appointment in 1877, Sir Henry Layard obtained for the Trustees of the British Museum a firman which practically gave Mr. Rassam a roving commission over the whole of the Tigro-Euphrates Valley. This firman was of such a character that the explorer was able to carry on work in Armenia, at Toprak-Kala, on the shores of Lake Van, where he discovered the Temple of Khaldis, built by King Rusás; in Assyria, at Nineveh, and Nimroud; and in Babylonia, at Babylon, Birs Nimrud, Aboo Hubba, and other sites. Shortly before his recall Sir Henry Layard was able to get a further extension of the permit until the spring of last year, and the result has been a great and important increase of our Babylonian col-

lection. Some thousands of inscribed tablets have been sent to England, and valuable additions have been made to the knowledge of Babylonian art and architecture hitherto so scanty. Towards the close of the time covered by the firman however, great difficulty was experienced in carrying on the work, owing to the interference of local authorities, and now that a renewal of the permission is asked for it is met with evasive answers, if not a refusal. It would seem that there is a decided political phase in the matter, for while applications by Lord Dufferin for firmans for the Palestine Exploration Fund, and the British Museum, met with the usual Oriental treatment, and are consigned to the oblivion of an infinite to-morrow,—the requests of other nations are readily conceded. It is this that has caused so much anxiety to English archæologists, as at the present time the French Government have obtained a firman, not only renewing the former permit granted to M. de Sarzec over the Villayet of Busra, but extending over other portions of Babylonia, and it is feared, over Aboo Hubba, where Mr. Rassam has made such brilliant discoveries, but where so much more remains to be done, and older and still more important antiquities lie buried. The importance of our continuing the work on this site is very great, so great that we cannot afford to lose it without an effort. It is one of the oldest cities in a land of ancient cities, extending back more than thirty-seven centuries before the Christian Era, and containing, as shown by a discovery made within the last few days, contemporary inscribed records of its earliest inhabitants. But 100 chambers have been opened out of the 300 or 400 which lay buried beneath the mound. The tablets and inscriptions recovered reveal a most important and encouraging fact as to the condition of the treasures there. It is found that, as the cases of tablets which were packed on the spot are now opened, the tablets which are of the legal and commercial class have been recovered from the ruins in batches, which comprise tablets dated in the same regnal years of the kings. This, in addition to greatly facilitating the study of the inscriptions, also shows most clearly that the record chambers of this temple and palace had not been subject to the same violent disturbance as had the libraries at Nineveh and Babylon, where the documents were scattered in chaotic confusion, and broken in many fragments. The examination of the collections which Mr. Rassam has made shows that a large number of much older records still await unearthing, and as we have the right of first finder, and place our collections in a museum open to all the world, it is to be hoped that archæologists will not rest content with an incomplete collection. But the complaint which we may thus make in regard to Aboo Hubba applies also to other sites in Babylonia, to Babylon, Borsippa, Tel Ibrahim, &c., where lie buried most priceless records, in rescuing and removing which we rob no Turkish National Museum or local collection. In the same way, and on the same grounds, has the Palestine Exploration Fund a just claim to support. The regions east of Jordan are almost *terræ incognitæ*, and yet they are hurried out of the land where they are doing good work not only to the benefit of science, but to the Turkish Government themselves, by supplying them with the most perfect map that can be produced; and in the face of this, firmans of most broad and open character are granted to the Austrian and German Government Commissions in Asia Minor and Western Armenia. It is hoped, therefore, that all who are interested in the continuation of a work so important to all branches of research will endeavour to bring pressure to bear on the authorities both here and in Constantinople, so that the work may be continued.

A New Cottage Hospital for Trowbridge. The foundation-stone of a new cottage hospital, a gift to the town of Trowbridge by Mr. Jesse Gouldsmith, son of the late Mr. Gouldsmith, of Clifton, was laid on Saturday last. The building and site are both given, and we understand the liberal donor will also endow it. The erection will likewise include a soup-kitchen, and the total cost will be about 3,000*l*. The stone was laid by Mrs. George Llewellen Palmer, daughter of Mr. Gouldsmith, to whom the committee presented a silver trowel and ebony mallet, suitably inscribed.

SOME RECENT FOREIGN WORKS ON HYGIENE.

We in England are rather disposed to regard our Continental neighbours as singularly behind hand in sanitary matters. At this season of the year especially, when the discussion as to the scene of the annual holiday is occupying the minds of so many, one is constantly hearing of the dangers of the Continent referred to as if there were no similar dangers at home. While, to some extent, it is true that an absence of attention to questions of hygiene constitutes a large feature of foreign existence, at the same time it must be admitted that nowhere has the question in all its bearings received more careful study than abroad. Many eminent professors have devoted their attention to the subject and have greatly advanced a science which, till within a generation or so, was but in embryo. Societies of hygiene and health societies exist in large numbers on the Continent, while the congresses of late years held at Paris, Turin, and Geneva have evinced the general interest felt in the question, every advance of which constitutes a calculable gain to humanity. How much, however, yet remains to be done, our statistic tables amply show. Frightful as has been the recent calamity in the lovely island of Ischia, its victims, as has been truly said, but barely exceed the number of those who almost every week in our island die by disease or causes which might have been prevented by due attention to the hygienic precautions prescribed by science. So directly beneficial are the results of advance in this direction that it seems indeed singular how slow is the advance made. We should, therefore, receive with especial attention any works which, dealing with the subject in a practical manner, enable those interested to realise the progress made and to appreciate the nature of the researches so far pursued, or which still remain to be prosecuted.

The interesting exhibition organised by the Health Society, held only a few months since, and the attention given to the question of hygienic clothing, show how practically the matter is at length being dealt with. Now, though this portion of the question is not exactly within the limits of our pages, yet it must be remembered that a house is after all little but another form of clothing, another of the means we adopt to protect ourselves against the inclemency of our climate. This our chief effort we endeavour to carry out to the best of our ability, and with some tolerable degree of success, so skilfully, indeed, in many cases that, were it not for the kind and beneficent action of nature, there are not a few of us who would probably succeed in asphyxiating ourselves in our own rooms. The results of the experiments of Herr Pettenkofer, the eminent German hygienist, as set forth in a comparatively recent work of his, "Populäre Vortrage," would, however, tend to show that, happily for humanity, the efforts to completely isolate itself from chill are aided by what might at first sight appear to be a serious inconvenience, the porous nature of the materials with which the walls of our houses are built, this permitting a free and positively perceptible circulation between the outer and inner air, tending largely to lessen the dangers of the excess of moisture which would be attendant on existence in unventilated apartments occupied during any lengthened period. The porous character of ordinary building materials can be determined in a most simple manner. Herr Pettenkofer, in his experiment, takes a cylinder of dry mortar about 6 in. long and an inch in diameter; when this cylinder, covered with wax,—except at each end,—is held to a candle and blown through, the flame can be seen distinctly to flicker, thus completely proving the porous nature of the mortar, when dry; wetted, it becomes perfectly impermeable, and the damp, once lodged in the pores, is much more difficult than the air to get rid of. In ordinary weather it will be found that the walls of our houses carry on regularly the good work of ventilation, clearing the air of the house of the moisture with which it is charged,—moisture arising from the human breath, and other causes,—and allowing it to slowly evaporate into the outer air. To assist the action porous building materials should, in fact, be especially employed.

In a work recently published in Belgium by M. Putzey, professor of Hygiene at the University of Liège ("*L'Hygiène dans la Construction des Habitations privées*," Brussels, 1883), some interesting experiments are detailed respecting the relative degree of porosity of various building materials: brick coming foremost, followed in due order by limestone, freestone, and, lastly, sandstone. The pores of a baked brick, we learn, occupy no less than 25 per cent. of its whole bulk, but in an unbaked condition as much as 60 per cent. Plaster, from its compactness, is almost the least permeable of all materials. It may be mentioned, however, of the porous nature of bricks that they naturally are more easily wetted. Much, however, remains still to be ascertained in this direction, and research is being pursued by several eminent hygienists abroad. Dr. Layet, professor of hygiene at Bordeaux, who is prosecuting (so a writer states in a recent number of the *Revue des Deux Mondes*) a series of experiments on the subject of the relative porosity of building materials, obtains his data by subjecting his specimens (placed under a bell) to the action of coal-gas, the length of time to light which as it issues from a tube attached to the stone or brick determining the degree of the porosity of the material. M. Poincarré, professor of hygiene at Nancy, places his specimens, all reduced to a similar size, into water, and their difference of weight enables him to ascertain their relative porosity. His experiments, it would appear, go far to show the inefficacy of most existing protective varnishes, and so-called hydrofuges.

It is this power of retaining the moisture which has always rendered the occupation of newly-built houses so dangerous. Water filling the pores both of the brick, or stone, and mortar, all ventilation is effectually arrested, while the conductibility of the wall being increased by its condition, the loss of interior warmth, which tends to flow outwards, is considerable. The determination of the quantity of moisture retained by newly-set-up building materials, is one of the points to which Herr Pettenkofer has turned his attention. Taking for his purpose a house erected on cellars, with a ground-floor and two stories, each consisting of five rooms and a kitchen, and reckoning that such a house would require some 800 tons of bricks, Herr Pettenkofer's experiments lead him to the conclusion that these retain at least forty tons of water; the mortar, though far less in bulk, retaining an equal amount, a total of some eighty tons of water being thus obtained,—no small amount to be got rid of. The methods that have been attempted to dry newly-built houses are, as our readers are aware, innumerable. Those, however, are alone worthy of any attention which combine the use of heat and plentiful ventilation to ensure rapid evaporation. In Paris it is customary to light in the centre of the room a large coke fire, which, with open windows, proves an efficacious and easily applied method. In some countries, however, severe police laws regulate the occupation of newly-erected houses, experts being called in to determine the condition of the walls, which, tapped with a hammer, reveal to the experienced ear how far the wall is dry. The work of M. Putzey enumerates, however, several other methods by which the proportion of water existing in building materials can be determined, the conditions naturally largely varying according to situation and circumstances. Authorities do not yet even agree as to the proportion of moisture which can be retained without danger to health, some setting it down at 20 per cent. Pettenkofer, however, urges that 4 to 5 per cent. should be considered as the limit. The question,—as truly remarks M. Radau in the paper to which we have already referred,—requires research of a much more serious character than has so far been devoted to its details.

The sweating of walls, and the stains which constantly appear on their surface, even when apparently dry, is another point to which professional attention is constantly drawn. Chemistry has attempted to explain the matter by the suggestion of chemical action, but Pettenkofer has most satisfactorily, we think, disposed of the question. He shows, in the first place, that the wall apparently dry is only in reality so at, and near, its surface, and the stains arise from the condensation of the atmosphere on the cold wall caused by a change in the temperature, either natural or by the lighting of fires. Hence it is evident that complete aëration is the sole remedy, and the use of porous materials must necessarily assist this action. This natural action of the ventilation, which is

ensured by the use of porous material, can, however, be largely arrested by the covering of the wall, experiment proving that whitewash is the least preventive of these coverings, then distemper, then glazed paper, then ordinary paper, and, lastly, oil colour, which most successfully checks the beneficial action of the imperceptible air-currents which pass through the walls of the house. It will be seen, therefore, that the efforts usually made to stop out all communication with the outer air are based on an erroneous principle. The healthy state of the atmosphere we breathe in our apartments would be soon vitiated by an excess of moisture were it not that the excess is carried off by the action of nature in favouring a natural system of evaporation and ventilation through our walls and floors, which latter are of as equally permeable a character,—a feature which should duly be considered by every architect. The soil on which he builds his house has always been urged upon him as a matter for consideration. The porous nature of earth, capable of being saturated with, retaining, and exhaling noxious gases, is familiar to all; this point, therefore, must be remembered by the architect, as the air from sub-soils has a distinct tendency,—especially in winter, when the fires are lighted,—to ascend into the house, it having been calculated that there may easily exist in a room as much as 10 to 15 per cent. of subterranean air. The infiltration of coal-gas may therefore, as M. Radau shrewdly points out, impregnate the soil of a street, and thus penetrate with fatal consequences into our houses. The air confined in vegetable earth contains a very large share of carbonic acid. Pettenkofer and other authorities agree that this augments in proportion to the depth from the surface. We do not exactly know,—remarks the writer we have already quoted,—in what manner the soil and sub-soil intervene in the etiology of certain endemic diseases; it is a question open to discussion. But we must approve of those hygienists who counsel that all houses should be rendered independent of the ground either by being built on air-chambers, or by the use of complete air-proof flooring.

THE WELLINGTON MONUMENT.

We have several times spoken, in language of the strongest condemnation, in regard to the injury done to the noble monument by Stevens in St. Paul's Cathedral, owing to the unsuitable, and, indeed, for purposes of sculptural effect, almost ruinous position in which it has been placed, and we are, therefore, glad to see that some degree of public protest is being made about it, and that the daily papers have begun to discover that it is a subject for paragraphs; and, as it is only the last and outside wave of an artistic agitation that ever reaches, in this country, the shores of newspaper paragraphy (if we may coin the word) we may conclude that there is a pretty strong and wide-spread feeling about it in the artistic world. But it is an extraordinary thing that in England not only are we liable to such huge mistakes as this of the misplacing of the Wellington monument, and thereby spoiling one of the most successful works of art of modern times; but even when people come to their senses and wish to put the thing to rights, they often seem unconscious of the proper reasons for doing it, and, as in this case, leave out the most obvious and emphatic one. Here is a memorial, signed by a number of persons interested in art, praying for the removal of the Wellington monument to a position under one of the nave arches, as originally intended, and for its completion by the equestrian figure which was intended to form the culmination of it (a point which was separately considered in our last); a memorial laying stress on the fact that the monument is in too cramped a position, and that the wooden screen of the Consistory Court hides it considerably from view from the nave, and yet not a word is said about the greatest defect of all in the position, viz., that the ideal figures, which constitute the most important portion of the monument artistically, can only be seen either against the window-light, or, in a very foreshortened manner, from a position immediately under them within the screen of the Consistory Court. The disadvantage to a grand group, like that of "Valour and Cowardice," of being viewed from a position where the spectator has to hold his head back and look up at the sole of "Cowardice's" foot, is obvious enough to every one; but the more serious mischief is that, when we look from a greater distance from the nave, though the figures are then visible over the screen, they are seen against the light, presenting, consequently, only silhouettes to the eye, with no light to show the modelling on the side next the spectator. There never was such an absurdity heard of as to place sculptural groups under such a light; no sculptor would dream of doing it, and that Stevens should willingly have acquiesced in it is simply impossible; and, if this had been brought out properly in the memorial which has been sent to the Premier, the case of the memorialists would have been twice as strong as it has been made to appear. We sincerely hope, notwithstanding this curious and characteristic omission, that the memorial will have the desired effect, and that we may soon be cleared of the discredit of placing our most successful modern monumental work in such a position that half its merits are lost.

THE GREAT GEORGE-STREET SITE, WESTMINSTER.

"He, like to a high-stretcht lute-string squeakt, 'O, sir,
'Tis sweet to talk of kings. . . . . At Westminster
* * * * *
Your ears shall hear nought but kings, your eyes meet
Kings only; the way to it is King-street.'"

DONNE, *Satires*.

Certain communications that have lately passed between the Metropolitan Board and Her Majesty's Commissioners of Works tend to solve a long and much-vexed question. The determination of a site for the new Admiralty and War Offices at Spring-gardens disposes of the project to erect them on what is known as the Great George-street site. The latter is thus left free for other purposes to be agreed upon between the several authorities concerned. By the nature of the case the Board of Works are necessarily charged with completing the widening of Parliament-street, which must be accomplished sooner or later as an important metropolitan improvement. Meanwhile, the Crown has become possessed by sundry purchases, and at a total cost of some 287,000*l.* of a large portion of the area under review; the police-station there is valued at 30,000*l.*; and the remainder of the property is said to be worth 420,000*l.** The Government therefore stand as vendors of land to the Board under circumstances which, whilst involving considerable outlay, will probably result in no great loss to the national funds, and are favourable in many respects to the Board themselves. For taking the whole cost of the entire purchase as say, 737,000*l.*, the value of the ground with its fresh frontages may be fairly assessed at 755,000*l.* It would appear that Mr. Shaw-Lefevre is willing to let the Board purchase the Crown property for the price it has cost, namely, 317,000*l.*, taking in exchange so much of the new frontages as he may be advised shall strike a balance between that sum and one which the Board could legitimately obtain from the ordinary vendor. The latter, it appears, have informally agreed to fall in with the Government scheme. Briefly outlined the Commissioners' proposals for appropriating the ground itself are as follows:—to throw back the western side of Parliament-street so as to form an alignment with the Colonial Office, and to move King-street, widened to, say, 50 ft., westwards of its present course. This, with the concomitant demolition of part of Great George-street (at its eastern end) would provide a fair area for a block of buildings, whether clubs or Government offices, between Charles-street and Parliament-square. At the same time it is contemplated to widen Charles-street to about 70 ft., and construct an altogether new thoroughfare, 40 ft. in width, parallel therewith to join the new King-street with Delahay-street. So thorough would be such a re-adjustment of the streets in an unusually interesting locality that we may conveniently take the opportunity to give a brief sketch of its history and antecedents.

It is generally supposed that the widening of Parliament-street was but in effect to restore to this quarter the open space that had so long existed, as was only befitting, in the immediate vicinity of two royal palaces. But so far from this being the case the noble vista which confronts the spectator from its more elevated end at Charing-cross was within the last 130 years closed in at Whitehall by the Cockpit or "Holbein's" Gate and the gabled houses before the gallery which connected that gate with White Hall. The gate was pulled down in 1750, having been latterly in use as a State Paper Office. Two thoroughfares lay beyond; the narrower, with the Privy-garden and Bowling-green on the left, communicating by way of Brewer's-yard with Derby-court* and Cannon (Channel) Row and so to the Woolstaple. King-street, the wider thoroughfare, which dates from the time of Hubert de Burgh, branched off at the Earl of Rochester's house, since occupied by the Board of Trade. Passing towards New Palace-yard these were joined by Petitioner's-alley, Stephen's-alley, White Horse-yard, and Clinker's-court. From Cannon-row, Todd's-wharf, Bennet's, Derby, and Manchester courts gave access to the river. The last-named commemorates a house of the Montagues, Earls of Manchester, and Dorset-court that of Anne Stanhope, second wife of the Protector Somerset, wherein Anne Clifford, Countess of Dorset, was born 1590. Along the northern end of King-street, to the west, were the Cock-pit and Henry VIII.'s tennis-court, and here against Downing-street† stood the high gate, erected by King Henry VIII., and pulled down 1723. Hence there ran out of King-street into Duke and De La Hay streets several courts and streets,—Duffin's-alley; Axe-yard‡, so-called from the brewery of that name mentioned in a document 23rd Hen. VIII.; Sea-alley; Bell-yard and Crown-court (since Crown-street); Charles-street, home of Ignatius Sancho the play-loving negro; Gardner's-lane, leading into Bowman's and Cherry Tree-courts; Antelope-alley and the Blue Boar's Head and George yards. What is now Parliament-square was represented by Union-street, Bell-alley, Little Sanctuary, with Dean and Bow-streets. Bow-street turned into Thieven or Thieving-lane which communicated with Broad Sanctuary by Green's-alley. Curving westwards Thieving-lane met Long Ditch (Princes-street) at Broken-cross between the Aquarium and Westminster Hospital. This, the oldest subscription hospital in London, had been first established in Petty France, next in Chapel-street, then in James-street. A plot of ground was subsequently purchased of the Government for 6,000*l.* in Broad Sanctuary,—site of the ancient Sanctuary cruciform church, and subsequently of Westminster Market. The pestilent and miserable purlieus of Green's-alley and the two Angel-courts only enhanced the perplexities of Thieving-lane. That street derived its name, says Stow, "for that thieves were led that way to the Gate House while the Sanctuary continued in force." To take them through the Sanctuaries when passing from King-street to Tothill-street would be to give them their freedom. An extensive clearance in this undesirable quarter and around St. Margaret's Church was effected in the period 1807-8, when St. Margaret's-street, which had been made out of St. Margaret's-lane by the removal of the old Fish-yard and "Heaven" and "Hell," was further improved, and Dirty-lane, its continuation towards Lindsey House at Millbank, became Abingdon-street.§ Several picturesque Elizabethan houses came down, but their destruction proved a gain in every other respect, since they contributed in an eminent degree to the notoriety so long attaching to Westminster. The north-western entrance into New Palace-yard, King Richard III.'s Gate, stood until the year 1706. Westminster Bridge, after nearly nine years building, was opened in 1747, the strong round tower and water-gate having been destroyed for its western abutment. In 1750 George Inn-yard was converted into Great George-street, and the Woolstaple into Bridge-street. On the making of Parliament-street, two or three years later (pursuant to the Act 29 Geo. II., c. 38), the Market which stood at what is now its south-western angle was transferred to the site of the "Quaker's" tavern by the present Sessions House. The Gate House, about

* For these figures, as computed by Sir Henry Hunt, see the *Builder* for the 4th inst., p. 165.

* Derby-street, named after the town mansion of William sixth earl of Derby, which was surrendered to Parliament *temp.* Charles I. In this house died, 1643, John Pym. During the next reign it was the Admiralty office.

† From Sir George Downing, secretary to the Treasury, 1667.

‡ Since Fludyer-street (1766), from the ground-landlord, Sir Samuel Fludyer, bart. Here lived Sir Wm. Davenant and Pepys.

§ Said to be called after Mary, wife of Thomas Abington, of Hinlip, Worcestershire, and eldest daughter of Lord Morley. Willing to screen her husband, she addressed (from Montague-close, Southwark) the historic letter to her brother, Lord Monteagle, which revealed the Gunpowder Plot.

100 yards from the Abbey western door, consisted of two portions: the one opening into Tothill-street, the other towards College-court (Great Dean's-yard), the Little Almonry, the Almshouses, and Duke's Head-court. They were built *temp.* Edward III. by Walter Warfield, cellarer to the Monastery. The Tothill portion formed an ordinary jail; the other, appertaining to the Bishop of London, a prison for offending clerks. By his paper on King George III.'s coronation,* Dr. Johnson was instrumental in procuring the demolition of a building which had served as the gaol of Nicholas Vaux, Marchmont Needham, Sir John Eliot, and Savage, in which Lovelace composed that exquisite gem, "To Althea, from Prison," and Raleigh, on the eve of his execution in New Palace-yard, wrote in his Bible the fine lines beginning:—

"Even such is Time, that takes on trust
Our youth, our joys, our all we have."

We have thus briefly indicated the leading features of an area at one time defined by a watercourse that flowed around the Precincts. The stream, or rather ditch, giving names to Long Ditch and Channel-row, joined the Thames at the foot of College-street, and at the northern end of Cannon-row. Queen Matilda erected a bridge across it at the eastern corner of Gardner's-lane; another bridge lies underground in College-street; sewers now flow in its bed. About the Infirmary Garden are remains of the Precinct walls, of whose four gateways the foundations of that near New Palace-yard were laid bare in 1838, during the construction of a sewer. The Sanctuary has long disappeared that was witness to the sorrows of Edward IV.'s Queen, together with the Almonry where Caxton printed Gower's and Chaucer's poems, but there is yet standing, though bearing a threatened life, a valuable relic of these times in the shape of a Norman tower, refitted by Abbot Litlington, known as the King's Jewel-house, and latterly as the Parliament Office. By some attributed to King Richard II.,† others would claim it for the monk's primitive Refectory and Dormitory during the building of St. Edward's Abbey church. A course of Roman tiles can be traced in its lower story. King-street presents little of the aspect it had when the author of the "Faërie Queene" died here for lack of bread, and it is even deserted by the recruiting sergeants who, in our own day, made it gay with their full-dress tunics and ribbons. Yet the memory of many a famous name lingers around. From his house by Blue Boar's Head-yard, in King-street, Cromwell started for Ireland in 1649. Here lived Sir Thomas Knyvett, who seized Guy Fawkes; Dr. Sydenham, over Ram's-mews; at the house of Lord Howard of Effingham, Queen Elizabeth's Privy Council frequently met. This street has seen that sovereign pass through in state to Parliament over fagots thrown down to fill ruts in the roadway; she and James I. were taken through it to their graves in the Minster; King Charles I., guarded by halberdiers, returned from the Hall in a close chair through King-street.‡ Lord North died (1677) in what had been the first, and for many years the only, brick house here; and at the Bell Tavern the October Club met in the reign of Queen Anne. Vine-street is a relic of "the vineyard lately made by Bainard," which is mentioned in Domesday Book; Wenceslaus Hollar, who worked for the booksellers at the rate of 4d. an hour, died in Gardner's-lane, his home at the time in possession of the sheriff's officer. Another worthy of Westminster should not be forgotten,—Wilkes's house was the last on the right hand down Prince's-court. Prior's house in Duke-street,—a fashionable quarter in its day,—faced Charles-street:—

"Our weekly friends to-morrow meet
At Matthew's Palace in Duke-street."

By one corner of De la Hay and Great George streets lived Lady Augusta Murray, otherwise known as the Duchess of Sussex; by the opposite corner is the house which Lord Jeffereys built for himself, and was used after his death for the Admiralty Office, until the occupation of Wallingford House. Its north wing (demolished a few years ago), forming the great hall where Jeffereys transacted business during vacation, was converted into a chapel in the year 1769.

* "Reasons offered against confining the Procession to the usual Track."

† See, though, the grant of June 7th, 1377, 51 Edw. III., in the "Niger Quaternus," fol. 79. Here are kept the Whitworth gauges and other Board of Trade standards.

‡ Herbert's Narrative, Ath. Ox., ed. 1721, ii. 798.

ERRATIC ORNAMENTATION.

In that busy doubtful time which saw the repeal of the Corn Laws, and the germination of the idea of the International Exhibition of 1851, the students of the Metropolitan School of Design were allowed to practise freehand drawing, modelling, and drawing from casts in the upper story of Somerset House. There were signs of dissatisfaction amongst the students occasionally, and on one occasion there was what might be termed a rebellion; at all events, it led to a revolution, and the school became quiet in demeanour, if somewhat ruffled in spirit. The masters were all able artists,—they were not drawing-masters in name,—even though they included such names as Redgrave, Dyce, and Herbert. There was a vagueness of purpose in the course of tuition, as if the whole course of study was guided by the idea that you had only to teach the drawing of curved lines to produce a designer of art-manufactures. Those who went onward and drew the figure well, forgot the purpose of the Government School, and joined the numerous body of artists who were then being recognised as being something more than "limners." The regularity and sameness of the teaching led to a regularity and sameness of pattern, and, were it not for the influence of the Exhibition of 1851, we should have been content to take a bit of ornament from one example, and a scrap from another, without a particle of original thought or adaptability to the purpose for which it was intended. At this period one of the most popular lecturers in England pointed out that our art was confined to the drawing-room; and, our music to evening parties. We had, he told us, as Whitfield and Charles Wesley had said before, given the devil all the best music, and left the weather and the damp to stain and vary the monotony of the whitewashed interiors of our ecclesiastical edifices. It hardly required the sarcasm of the eloquent Dissenting lecturer to aid the Oxford Tractarians in transforming our humdrum liturgical services into spectacular celebrations, or to change the whitewash, so dear to churchwardens, for the various specimens of tawdry scrolls and meaningless panels in distemper, which became the mural decoration, in so many instances, of the choirs and chancels of our minsters and parish churches. It seemed to be taken for granted that the Church of Rome had preserved the traditions of the pre-Reformation era in matters of church decoration, and any examples however debased, and however tasteless and meaningless, were copied or adapted to the new ideas of decorating the Temple of the Lord. This is little more than a generation ago, yet we hear architects and decorators speak of this period as "early days" when *true* principles were not understood. These remarks were pertinent enough when applied to the structure and details of a building, but they should not be applied to the ornamentation, or, in some instances, to the pointed rubble work which is left as a rude network of stone and plaster to hide the want of knowledge to finish the walls in a tasteful and appropriate manner. The windows, which contained in many instances choice specimens of stained glass, were cleared out to receive either plain tinted quarries or violent and gaudy coloured glass, which offended the eye and rendered the light unbearable or too dim. The true silvery tone of the ancient glass, enlivened by speckles of colour, by shields of coat-armour, or representations of some saint or legend, had been lost sight of. The purposes of the windows had been forgotten, and the small lights of a village church were filled with glass as full of colour and as dark as the immense east windows of York Minster. There was neither purpose, taste, nor appropriateness in the introduction of these monstrosities of colour. It was simply the erratic fashion of the time, which we are only reforming indifferently at the present day, when we are fluctuating between the repetition of a simple diaper pattern and the true subordination of colour to light with a clear distinctive purpose and design.

It is very much to be doubted if the æsthetic fever, of which we have heard so much in the pages of *Punch*, is not owing to these erratic ideas of ornamentation. The blending of the Pompeiian panels with ideas from Japan is incongruous in itself, but true in principle, if the principles harmonise in colour, form, and proportion. The decorations which have been found on the walls of the buildings in Pompeii have given us an excellent idea of the manner in which the ancients gave brilliancy to their colours, and grace to their figures. They were not overloaded compositions, or killed by confusing hues and lines. The introduced figures were graceful, the foliage natural. The artist did not confine himself to the particular stencil pattern, for he varied flowers and leaves and attitude as it suited his taste. The result was variety, and the effect pleasing. The Japanese have worked on a similar line. They are fond of a dark background, on which their gold and colour show brilliantly. Their patterns are not conventional in the sense of being repetitions of each other, but they are varied, and at the same time have sufficient in unison as not to offend the most fastidious eye. In the American International Exhibition some three or four pillar vases were exhibited which might have served as sections or bases of supporting pillars. The ornamentation was some lilaceous plant with large seed-capsules, and the same idea was repeated on each specimen. One was in low relief:—the leaves lay flat on the surface, and the seed-vessels were only raised above the surface by the hand of the modeller pressing the inner surface of the clay so as to cause a protuberance on the outside. The effect was excellent. Another was in high relief:—the petals were as delicate as egg-shells, and the insects fluttered over the flowers, and the birds snatched at the pendent seeds which were loose in the ruptured capsule. The third showed the pattern in relief between the two extremes. Here we had an example of an art-workman carrying out an idea with a definite purpose. When these vases were brought to England the idea was imitated. It was a moulded, formal, overloaded, piece of pottery-manufacture without spirit or feeling. It is thus with all our Japanesque work. We became erratic, without being artistic. We multiply patterns, but do not produce beauty; we manufacture forms, but omit that variety and grace which is the essence of art. Whilst mere cheapness is the order of the day, we cannot wonder at this. We know how often the finest designs of an architect are spoiled by the want of funds or the parsimony of those who have the spending of them, and that recourse must be had to moulded bricks, terra-cotta, or the turned balusters or ornamental bosses from the quarries at Box, if ornamental details have to be employed. If we must have pictures, and cannot buy paintings by skilled artists, we must be content with oleographs or chromos; but, because some special style of ornament is pleasing, do not let us repeat the eccentricities whilst overlooking the special beauties to which alone it owes its charm and attraction.

Miss Eliza Meteyard, in one of her artistic sketches, makes her art-student seek inspiration for new forms of ideal beauty in an observatory by looking at the nebulæ which float in space. Our art-students have a wider field of novelty and of suggestive beauty of form and colour at home, which can be studied day by day. The Worth gallery or museum at Kew Gardens is a treasure-house of colour, of form, and ornament. If, as it is possible will be the case, colour will be used in the adornment of the exterior of our dwellings to a greater extent than at present, here is a very Thesaurus of ideas adapted to every species of ornament culled from every clime. The indefatigable industry of the lady who painted these wondrous transcripts of nature's marvels is not more surprising than the blended forms and colours of tropical verdure and quaint forms she has enabled us to see. A skilled potter saw fresh ideas of form and colour in a case of shells which would tax the resources of his art to imitate. The intelligent adaptation of these forms to our every-day use, will perhaps open up a truer way to the use of natural beauty, both in form and colour, than we have yet found out. We are too apt to ride our hobby to death, to carry our ideas too far. An exaggerated truth is not far removed from a falsehood, just as an exaggerated likeness of an individual becomes a caricature. We may pervert beauty into ugliness, and, by neglecting the harmony of hue, turn a source of pleasure into an offence. The old builders sought their effect, first, in the justness of their proportions to the object they had to carry out, and, next, in the appropriateness and suggestiveness of the accessories. The circumstances were taken into account, and the true principles of art adapted to them. We did not have art prostituted to circumstances as is too often the case

now, nor did they in their adaptation seize upon an erratic variation, and perpetuate it, to the neglect of true beauty and the everlasting principles of grace, line and proportion.

LUBRICANTS.*

Lubricants, as is well known, are used for reducing the friction of the moving parts of machinery to the lowest possible degree, thereby preventing undue wear and tear, and, at the same time, obtaining the greatest possible amount of work from the machinery. Owing to the extensive introduction of mechanical power during the last thirty years, the consumption of lubricants has grown in proportion, until it is now enormous. Lubricants are supplied to us by all the three kingdoms of nature. We derive tallow and train-oil from the animal kingdom; olive oil, rapeseed oil, palm oil, and cocoa-nut oil, from the vegetable kingdom; resin oil, an intermediary oil, so to say, between the vegetable and mineral kingdoms; and mineral oil pure and simple, from the mineral kingdom.

Tallow is prepared from the fat of cattle and sheep by being heated with water, sometimes with the addition of diluted sulphuric acid or caustic soda, either by the direct application of heat or by hot steam. By this treatment the cellular tissues are destroyed, and the pure fat is separated, which then settles as a layer on the surface. Tallow thus prepared forms, at an ordinary temperature, a yellowish white, pretty hard mass, which melts at a temperature of +40° C. It contains, if not freed from acids by alkalis, besides the neutral fats, from 1 to 5 per cent. of sebacic acid. In examining tallow, care should be taken to ascertain whether it is free from cellular tissues, free from mineral acid, as well as extraneous additions (other fats, sebacic acid, mineral substances, &c.)

Train-oil, prepared from the fat of seals, &c., in a manner similar to tallow, forms, at an ordinary temperature, a liquid of a light or dark brown colour and of a peculiar odour, solidifying at a temperature of from +5° to +15° C. As a rule it contains a large proportion (up to 5 per cent.) of sebacic acid. The same care should be observed in examining train-oil as is recommended in the case of tallow.

Olive oil is obtained, by pressure, from the fruit of the olive tree, cultivated largely in the South of France and Italy. It forms a beautifully yellow liquid of a peculiar odour and a mild taste, which begins to get thick at a temperature of +2° C. The contents of free sebacic acid is very small in the better descriptions; inferior sorts contain about 0·5 to 1 per cent.

Rapeseed oil or rape oil is procured from the seed of the various kinds of Brassica, the seed being crushed in powerful hydraulic presses. The oil thus obtained is a yellowish-brown to brownish-green liquid, of a peculiar odour and a pungent taste, which precipitates the mucilaginous substances of the seed which have passed in pressing only after being kept in store for some time, and becomes clear by this precipitation. But even perfectly clear oil contains mucilage or albumen in chemical solution, and these can only be removed by treatment with chemicals or by heating up to 200° C. The raw oil only cleared by storing was, and is still, used for lubricating bearings, especially railway axles. The purified oil, prepared by removing from the raw oil the mucilaginous and albuminous constituents by sulphuric acid, chloride of zinc, &c., and the free sebacic acid (on the average 0·4 per cent.) by treating with alkalis, is reserved for lubricating the more delicate portions of machinery and locomotives, steam cylinders, &c. The perfectly purified rape oil, and from which all acid has been eliminated, is of a light yellow colour, almost odourless, possesses a specific gravity of from 0·914 to 0·915 at 15° C., solidifies at a few degrees below zero, and melts again at about +3° C. In testing rapeseed oil, it must be ascertained whether it possesses the correct specific weight and melting-point, and whether it is free from mucilage, sebacic and mineral acids.

Palm oil and cocoa-nut oil are obtained from the fruit of the oil and cocoa-nut palms respectively, imported in large quantities into Europe. The fruit is either crushed in hydraulic presses, or the oil is extracted by means of sulphuret of carbon. The two oils or fats (for at an ordinary temperature they resemble butter) are now used very little for lubricating purposes, but extensively in the manufacture of soap.

Resin oil, gained by distilling the common resin obtained from the residue left in the manufacture of oil of turpentine from turpentine, was formerly used only in the preparation of "carriage grease," mixtures of this oil with colophony, fats, &c. Refined resin oil is now procured by freeing the crude oil by means of alkalis, and subsequent bleaching, the product being a clear semi-liquid of yellow colour, possessing but a slight odour, and having a high specific gravity (about 0·970). The oils are never perfectly free from organic acids, most of them containing about one per cent.

The class of mineral oils includes a number of lubricants which have nearly all a common origin with "petroleum." Crude petroleum, as it was first won in large quantities in America (since 1859), consists of an intermixture of many organic substances, which, on account of their exterior similarity to real oils, as well as for simplicity's sake, are called "oils." These oils, which may be distilled without decomposing, differ from each other by their various specific weights, as well as by their various boiling-points. For a long time the volatile ingredients only were extracted from crude petroleum, which were used for illuminating purposes, whilst little attention was paid to the heavy oils which remained after distillation. But when those residues grew in quantity, means had to be devised for utilising them, and it was soon found that they could be used as lubricants. At first the oil was applied in its original form, as left in the alembic, in which it still contains many impurities. But now in most cases, after the more volatile oil used for lighting purposes has been distilled over (at a temperature of from 150° to 350° C.), the lubricating oil is also driven over. The latter is then purified with acids and alkalis, and a product obtained which, in consequence of its purity, chemical constancy, and other valuable properties, appears very suitable for use as a lubricant.

As the raw mineral oils consist of a large variety of combinations related to one another, and as those combinations, according to a greater or less degree of distillation, &c., may appear in the most various mixtures, it follows that, independent of their greater or less degree of purity, the mineral oils may possess widely varying properties principally of a physical nature. Thus the colour of the different mineral oils varies from light yellow to dark brownish red; their specific weights fluctuate between 0·880 and 0·920; their cohesion,—their "body," as more generally expressed,—shows itself in all grades between the consistency, for instance, of the highly liquid linseed oil, when fresh, and the semi-liquid resin oil, &c.

But, however much their physical properties may vary, in their chemical nature mineral oils are closely related to each other. They all consist (of course, only real mineral oils are included) of a mixture of carburetted hydrogen, indifferent organic combinations, which possess neither acid nor basic properties. They do not decompose either at very low temperatures or at degrees of heat which far exceed those prevailing in the steam cylinders, &c., where they are employed. They do not undergo any change either on contact with the air or with water or steam; they do not attack metals, even the most easily oxydisable, such as potassium or sodium, and are as little changed or decomposed by the metals themselves.

This chemical indifference is the principal advantage possessed by mineral oils over all fat oils, whether they are of vegetable or anmial origin. All those fat oils decompose in time on exposure to the air, at high temperatures, on contact with metals or their oxides, and thus destroy, sometimes more quickly, sometimes more slowly, the parts of machinery which they are intended to preserve.

Notwithstanding those great excellences which mineral oils have over fat oils, great difficulties were at first experienced in introducing lubrication with the former more generally. Convenience, attachment to custom, and want of intelligence were amongst the obstacles which had to be overcome. Mineral oils were looked upon as entirely unsuitable for lubricating machinery, and fat oils as alone possessing the specific property of a lubricant; apprehensions were raised as to the "easy inflammability" of mineral oils, &c. But the introduction of mineral oils for lubricating purposes was also greatly retarded by the want of sense, and partly also by the want of honesty, on the part of individual producers and dealers. Properties were claimed for the crude mineral oil only possessed by carefully purified oil; when, finally, the price of the lubricating oil exceeded that of the oil used for burning, part of the latter was left in the lubricant, so that, especially if great pressure took place, it was found unsuitable. Notwithstanding all this, lubrication with mineral oil has, within the short space of the last five years, made such progress that it may justly be called, not only the lubricant of the future, but that of the present day. As the mineral oils, on account of their chemical properties, are far more valuable than fat oils, and, on the other hand, owing to greater variety physically, they may be adopted more readily for different purposes than fat oils, there is nothing to prevent their general introduction.

It will be gathered from the foregoing that the displacement of fat oils for lubricating machinery by mineral oils is a great technical progress. But the use of mineral oil is a great advantage also from the point of cheapness. The best mineral oils are now only half the price of fat oils. With suitable construction of the parts to be lubricated and a correct choice of the most suitable lubricating materials, the consumption of mineral oils is not greater; on the contrary, it ought to be less, as with mineral oil no hardening or thickening takes place, and thus there is no loss. Finally, in lubricating with mineral oil, the parts oiled are not destroyed, but, on the contrary, preserved; whilst the destruction of machinery parts, such as pivots, regulator valve-rods of locomotives, &c., is only too often a consequence of the use of fat oils.

But the ultimate introduction of lubrication with mineral oils is of importance also from an economical point of view. Our population is steadily increasing, and the difficulties of gaining a livelihood are growing with it. On the other hand, there is an abundance of suitable material for lubricating with mineral oils, for, without reckoning the almost inexhaustible stores in America, petroleum is now found in large quantities also in Russia, Gallicia, and Germany. Our food supply would be greatly extended, either directly, by appropriating large quantities of fats and oils for the maintenance of the people, or indirectly, by restoring the areas now used for the cultivation of oil-producing seeds for raising cereals. It is highly necessary in the economy of nations that there should be, not only a division of labour, but also a classification of the work to be done. Let the inferior materials, as far as they can, be used for inferior objects, whilst the more valuable products are reserved for a higher purpose.

* From a paper read by Herr Lux before the Society of German Engineers.

ARCHITECTURE IN HOLLAND.

The *Frankfürter Zeitung* lately published several articles dealing with the present tendency of architectural taste in Holland, special reference being made to the National Museum at Amsterdam. In a careful review of the entire subject, the *Deutsche Bauzeitung* has recently corrected certain statements made in these articles, while at the same time admitting their instructive nature. The question of the influence M. Cuypers, of whose works we have often spoken, has exercised upon the progress of architecture in Holland is discussed in a spirit of impartiality; and, whilst exception is taken to some of the commendatory language used respecting him by certain Dutch newspapers, the details of his professional career are recorded in such manner as to elucidate its most prominent features in an interesting manner.

In the preliminary steps in connexion with the erection of the National Museum, the question of the style of architecture used by M. Cuypers formed a subject of discussion in the press; a certain amount of dissatisfaction having been created by his being entrusted by the Government (without any competition) with the designing of the Central Railway Station at Amsterdam. The opinion at one time entertained in some quarters that M. Cuypers had been unduly favoured in the matter of the National Museum, is considered by the *Deutsche Bauzeitung* to have been unfounded, inasmuch as the plans opposed to his were, from a technical point of view, undoubtedly inferior to his selected designs.

The merits of the works of M. Cuypers are criticised at some length in the journal last referred to, and his creations are subjected to a comparison with those of Friedrich Schmidt, of Vienna; the inference being deduced that the former is, to some extent, wanting in the faculty of grasping and controlling the full resources of his art. It is, however, admitted that his activity is beyond doubt, and that Holland cannot at the present time put forward any more worthy representative of architectural skill than M. Cuypers, who is himself a native of Belgium. His adoption of the Mediæval style as his ideal arises from conviction; and in this he is allied with several leading German architects (such as Ungewitter, Hase, Statz, Schmidt, and their pupils), whose adoption of that period as their model is not induced by any religious feelings. Thus the position of M. Cuypers as a leading member of the Catholic party in Holland has not been the direct origin of his artistic creed. In fact, Hübsch, who, in Germany, is well known to be of strictly Catholic views, has abjured Mediæval art and has attached himself to the Early Christian style of architecture.

The manner in which M. Cuypers has designed the National Museum meets with adverse criticism from the writer in the *Frankfürter Zeitung*, on the ground that the building is wanting in those features which might be considered as worthily representing the dignified purpose to which it is devoted. At the same time due tribute is paid to the general and artistic intelligence of its architect. The opinion is expressed that he has not succeeded in his attempt to combine the Mediæval and modern styles, and to unite ecclesiastical and secular features in one work. The judicious arrangement of the interior is warmly commended, its general scheme allowing of the chronological features of the display being easily appreciated.

THE PROTECTION OF IRON AGAINST RUST.

It is still an open question how best to protect iron against oxydation, commonly known as rust. He who would find an effective preservative would indeed be a benefactor, for by its means numerous noble structures, into which the tooth of time is now eating slowly but surely, would be preserved to posterity. It is well known that wherever air and damp come into contact with even the smoothest iron surface rust soon makes its appearance. By its operation not only is there a constant waste going on, but the remaining iron is rendered brittle. A coating of less oxydisable metals, such as tin, later lead and zinc, and quite recently nickel, has, therefore, been applied, and with some effect. Earthy glazes, such as are applied to pottery, have also been used for coating iron vessels for household purposes. But all these coatings of metals or glazes have been found in most cases either impracticable in application or too expensive. For extensive use, coatings consisting of oils mixed with metallic oxides, earths, &c., have thus come into use.

Now, it has been observed that iron does not rust in dry air, even in dry oxygen. Iron, also, frequently does not suffer when exposed, without being painted, to the open air,—weather-cocks, fences, &c., having lasted for centuries. But in that case it has been found that they have been protected by the formation of a thin layer of peroxide of iron, which has acted as a safe covering against exterior influences. This experience led to the artificial production of a layer of magnetic oxide, superheated steam being used for the purpose. It is not to be supposed that such a treatment will find extended application; and a protective covering obtained in this way would only be effective in the case of iron in pure air, but not where it comes into repeated contact with water or carbonic acid. An interesting phenomenon has likewise been observed on railways. It has been found that iron sleepers and spikes rust very much if the line is not used for some time. It is assumed that iron bodies are more liable to rust in a state of rest than if they are exposed to vibration from time to time, in which case, perhaps, an electrical effect comes into play which lessens the affinity of iron to oxygen.

In demolishing old buildings, there are often found iron cramps, blocks, &c., which, so far as they are surrounded by mortar, are completely free from rust, just as if they had only left the forge. A similar phenomenon has been met with by M. Vicat, a French engineer, when he had the anchor fastenings of several suspension bridges exposed which had been put down thirty years before. Where the iron in the masonry was surrounded by rich lime mortar, there was not a sign of the formation of rust, whilst the continuations of the anchors in hollow spaces were rusted to such a degree as to have lost two-thirds of their former dimensions. It has been frequently observed that iron does not oxidise in water if small quantities of caustic alkalis, or alkaline earths, are solved in it, in which case acids of whatever nature would be excluded. It appears that the above experiences have served as the basis for the rust protective paints invented by Herr A. Riegelmann, of Hanau (Bavaria). He adds to his paints caustic alkaline earths, (barytes, strontian, &c.). By coating iron with them, it is said to be in the same state as the anchors of suspension bridges in lime mortar. Although simple coatings of such paints, owing to their slight thickness, cannot contain much alkaline matter, as is the case in walling in iron, alkaline effects will show themselves as long as they contain a certain percentage of it. But in any case those paints are free from active acids, which cannot be said of all our paints for iron. Should the paint be found in practice to possess the protective properties claimed for it, a step in advance would have been taken in the preservation of iron, and its greater application would be ensured.

THE ROMAN TOWER AT COLOGNE.

The question of the antiquity of the mosaic work in the so-called Roman tower at Cologne has recently been discussed in a treatise by Herr Michael Mertz, of Cologne. The work in question is on the exterior of the remains of an old tower in the Apernstrasse, and has received a certain amount of attention by reason of the geometrical figures and objects of which it is composed, in various arrangements of colours. The *Wochenblatt für Architekten und Ingenieure* remarks that, although no particular acquisition of technical or artistic knowledge is to be expected from the detailed examination of this specimen of ancient work, yet its unique character entitles it to attention as a relic of bygone ages, and, possibly, as affording suggestions of some practical value.

The external diameter of the tower is about 31 ft. and its internal diameter about 18 ft., so that the walls are about 6 ft. 6 in. in thickness. The older portion of the tower reaches a height of 19 ft. 6 in. above the pavement, and the lower part (up to about 6 ft. above the ground) is faced with layers about 4 in. in thickness of regularly hewn grey decomposed trapp and trachyte stones. In the succeeding layer (3 ft. in height) are semicircles of arch-stones surrounded by a narrow zigzag band in black and white. Between each of these, on a separate base, are five equilateral triangles, the insides filled with a chess-board design. Then follows a chequered band (14 in. in height), above which there is a similar band placed 3 ft. 5 in. higher. In the intervening space are wedge-shaped stones. Above the upper chequered band are figures of temples with four columns, which correspond in their position with the semicircles in the lowest portion of the ornamentation. Between these temples are circles formed of white arch-stones, and objects resembling shields in rectangular and lozenge form. White, black, and red stones are used in the work. According to the investigations of Herr Weiland, of Cologne, they consist of carbonic limestone (white), sandstone (red), and trapp sandstone (black). The colour of the latter is attributed to the protoxyde of iron which it contains.

As to the age of the work, Herr Mertz considers that it dates from the year 69 of the Christian era. From internal evidence, Herr Wallé (in his remarks published by the journal referred to) argues that it should be referred to a later period, and cannot have been built at an earlier date than between the fifth and seventh centuries.

Some years have passed since we sketched the tower in question.

Mr. G. G. Hoskins, F.R.I.B.A., is the architect appointed by Sir Joseph Pease and Mr. Arthur Pease, the executors of the will of the late Mr. Edward Pease, to design and carry out the new Library Buildings, Darlington.

CLOISTERS RECENTLY DISCOVERED AT WÜRZBURG.

Some of our readers may have learned by the newspapers of the opening up of an interesting cloister at Würzburg, heretofore built into a solid wall and quite invisible. The wall is now pulled down, and the cloister is exposed. Through Major Call, R.E., who was then staying there, Mr. R. Herbert Carpenter obtained photographs of the ancient work, and from these Mr. Brewer made for us the careful drawing we have engraved.

There are several peculiarities about these cloisters to which we would call the attention of our readers. Although the alternation of piers and columns is by no means uncommon in Romanesque arcades, yet we do not recollect to have seen precisely the same treatment that we find at Würzburg. The cloister to which it bears the greatest resemblance is that of the Grossminster, at Zurich. There are, however, several important variations in the two designs. At Zurich the cloister is vaulted, and each bay encloses three small arches, so that two corbels supported upon single columns occur between each pier or pilaster. Externally one semicircular enclosing arch extends from pilaster to pilaster. A vaulting shaft is attached to the inner face of every pilaster. Apart from these variations the similarity between the two compositions is very remarkable, even as to detail. Würzburg, however, has a slightly earlier character about it, though we should feel inclined to fancy, from certain indications which present themselves, that a good deal of the detail of this example is of a later date than the building itself. In all probability, as originally constructed, the cloister was quite plain, and the mouldings on the corbels, carving, &c., may have been executed a century or half a century later. The treatment of the pilasters is very peculiar, each one consisting of a single large slab of stone set up on end, and this has offered a splendid field for the sculptor. The three bas-reliefs discovered are works of the greatest possible interest. The first, which is at the extreme end of the arcade, is divided into three parts by vertical lines; the outer portions of the composition are filled by a beautiful treatment of the honeysuckle on one side and a peculiar series of knots on the other. The centre contains an oval niche filled with a bust. At first sight the composition has such a very classical appearance that one would be almost inclined to consider it a genuine Roman work, and it might be the monument of some Roman lady of rank. Closer investigation, however, will, we think, satisfy any one versed in the subject that this is not the case, and, in all probability, this curious and really elegant work does not date from an earlier period than the eleventh or twelfth century.

The pilaster which supports the sixth arch is, however, the most valuable portion of this singularly interesting cloister. It is carved on both sides, and each side is adorned with a bas-relief of the greatest possible value. One represents the Almighty in the act of benediction, the right hand raised, and the left holding a closed book. The attitude of the figure is grave and majestic. The head, which, before it was damaged, must have been a noble piece of sculpture, has long curling hair falling down over the shoulders, and a short-clipped beard. The figure is draped in a tunic and a kind of toga, and is seated upon a throne, which is adorned with a kind of Persian shawl pattern.

On the opposite side of the pilaster is a bas-relief representing a bishop, fully vested, holding a pastoral staff in his right hand,* and giving the blessing *with his left hand*. The mitre is very low, in fact, little more than a skull-cap, and the chasuble small and coming to a sharp point in front. The dalmatic and tunic are long, but fitting rather close. The ends of the stole hang down a long way below the tunic; the alb is very long, and without apparels. Behind the head is a nimbus, and over the shoulder is a curious kind of pallium, without crosses. Now, whom is this intended to represent? We think there can be little doubt that the person portrayed here is St. Killian, an Irishman, who first preached Christianity to the Franconians. He was put to death in 687, on the site of the Neu-Münster church. There are many reasons which lead us to this conjecture.

* We use the words "pastoral staff" advisedly, and again protest against the crook staff carried by a bishop being called a "crosier," the latter, in fact, being a cross and not a pastoral staff.

In the first place, the nimbus shows that the figure is intended to represent a canonised saint; and in the next place, the curious form of pallium is one which was worn by all the bishops of Würzburg; then, the absence of the sword would point to a date anterior to the establishment of the prince-bishoprick. The only other person whom it could represent is St. Burkard, the second bishop of Würzburg; but as he is generally represented with the sword of temporal authority we fancy this must represent St. Killian. We are totally unable to account for the blessing being given with the left hand. It is difficult to hazard a guess as to the date of these very remarkable works of art, but we should be inclined to ascribe them to the twelfth century, and are of opinion that they are from the hands of that wonderful school of sculptors established at Hildesheim by Bishop Berneward about the year 1015, and which was at its highest development at the middle of the twelfth century. The sculptures at Würzburg bear a strong resemblance to those adorning the side screens of the choirs of St. Michael's, Hildesheim, and the Liebefrauenkirche at Halberdadt.

Few antiquarian discoveries are more interesting than this one at Würzburg, and we sincerely trust that this very precious fragment of early architecture and sculpture will be carefully preserved *in situ*. If any attempt at restoration is made, it should be confined, as far as the old work itself is concerned, simply to repair. A roof, however, ought to be placed over the cloister, to protect it from the weather.

POPLAR AND BROMLEY TABERNACLE.

The building is designed in the Byzantine style of architecture, treated in a simple manner, so as to get some massive outline at a small cost. The columns to the portico are of Bath stone, with carved capitals, as also the triplet window and tower windows generally. An inner vestibule effectually shuts off draughts and sound, and the gallery stairs are approached from the portico. The building is of stock bricks, relieved with red and white strings, and the roofs are covered with slate.

Internally the seats are arranged with side aisles, and a spacious gallery runs entirely round the building. The platform is large and handsome. The pews and woodwork generally are stained and varnished. The dimensions are 50 ft. wide by 76 ft. long (in addition to this there is a large apse for the choir), height 40 ft. to the flat cubing of the collar. The contract was 3,284*l.*, and the accommodation is for 1,000 sittings.* The roof is supported by semi-circular ribs, embracing the whole span, and bow-string tied.

The works were designed by Mr. W. Allen Dixon, of 14, Great James-street, Bedford-row, and executed by Messrs. Holland, of Poplar.

THORPE BUILDINGS, BRADFORD.

Some few few years ago the Corporation of Bradford awoke to the fact that the town had outgrown its babyhood, and that the busy central part consisted of narrow, tortuous streets inadequate to accommodate the ever-increasing traffic, while the old buildings fronting to them had neither beauty nor antiquity to recommend them. That awakening was the commencement of a system of street improvements that has entirely remodelled the heart of the town, and though there is room still for improvement, and a good deal to do for which Parliamentary powers have been got, yet so much has been done that a Bradford man has no longer need to be ashamed of his town.

Thorpe Buildings, illustrated in the present issue, are built on a site thus cleared by the Corporation. It is at the intersection of Ivegate and Tyrrel-street, which two streets, with their continuations under different names, cross the town at right angles. Other important streets debouch on this intersection, and make one of the few open places in Bradford.

The site is surrounded on all sides by streets, and the plan of it may be described as a square attached to the base of a triangle, the square being at the left of the picture.

Illustrating the rapid rise in the value of land in this locality, it may be stated that the price of the triangle in 1871 was 26*l.* 5s. per square yard, and of the square in 1876, 42*l.* per square yard, both sold by the Corporation at public auction.

The area of the site is 7,000 square feet; the height of the building from the street to the top of the dormer is 75 ft. It was built by Mr. George Thorpe, from the designs of Mr. T. C. Hope, architect, Bradford. It is occupied by Messrs. Thorpe, Brothers, & Co., and by Messrs. George Thorpe & Co., the former as wholesale Manchester warehousemen, and the latter as retail drapers and silk mercers. It is one of the largest buildings of this kind in Yorkshire, upwards of 100 men and women being employed in it. It is built entirely with cleansed ashlar, from the Bradford quarries.

* The contract includes heating, lighting, and boundaries.

A TERRA-COTTA GROUP FOR CALCUTTA.

We mentioned some short time ago the production of a satisfactory group of statuary, representing "Agriculture," for the Government of India, and promised to find an opportunity to give a view of it. This promise we now redeem, repeating some of the few particulars we then gave.

The group is one of four, in buff terra cotta, intended for the adornment of some important new buildings. The designs for the whole have been approved by the Government of India. Each group will consist of a central ideal figure, flanked by a European and a native. The group "Agriculture," consists of a central figure of Ceres, with sickle in right hand, and some ears of corn in left hand. On her right hand stands a European indigo-planter, and on her left an Indian agriculturist is resting by his plough. The total length of the group is 10 ft. 3 in., and the height of the central figure, including plinth, is 8 ft. 4 in. The group has been fired to such a degree of hardness, it is claimed, as to render the work imperishable. Each figure is in one piece. The sculptor is Mr. W. F. Woodington, and the manufacturers are Messrs. Stiff & Sons, of London Pottery, Lambeth. The makers have the second group nearly ready. Both these groups will probably be exhibited in the Calcutta Exhibition before being placed in their final positions.

THE WALLS OF NUREMBERG.

That the interesting old walls of Nuremberg should be gradually disappearing is not a thing to be wondered at. "The practical people" of the age have decreed that the beautiful must give way before the useful; that art must move out of the way before the interests of commerce,—in other words, that everything is to be governed by the absolutism of the money-maker. Of course, when the necks of men are bowed down to accept this tyranny, art must cease to exercise any important influence over their minds; for no principle can take deep root in the heart for which one is unwilling to make some sacrifice. Probably the reason why the Greeks and the people of the Middle Ages were such consummate artists is to be found in the fact that art was never sacrificed to mere considerations of convenience, but being united with religion, and forming, in fact, a part of religion,* it was impossible to degrade art, or to sacrifice it to mere utilitarian considerations without at the same time offering an implied insult to religion. To a certain extent this connexion between art and religion remained unbroken until the sixteenth-century Protestantism opposed this union, from the idea that it savoured of paganism, though in Germany, owing in all probability to the personal influence of Luther, nothing was allowed to be done in the way of destroying works of art either in ecclesiastical or secular buildings, and the Lutheran churches of Germany are, owing to this influence, richer in works of Mediæval art than any other buildings in Europe except a few churches in Italy.

It is strange that, after the commencement of the seventeenth century, the wonderful influence which the Roman Catholic Church exercised over art seems entirely to have ceased, and instead of ecclesiastical architecture being in advance of domestic, we find the reverse to be the case, and church architecture becomes simply an exaggerated and coarse imitation of domestic. In England, immediately after the Reformation, the same thing had taken place, and the churches erected during the latter part of the sixteenth and commencement of the seventeenth century can bear no comparison with the superb mansions erected under Elizabeth, James I., and Charles I.

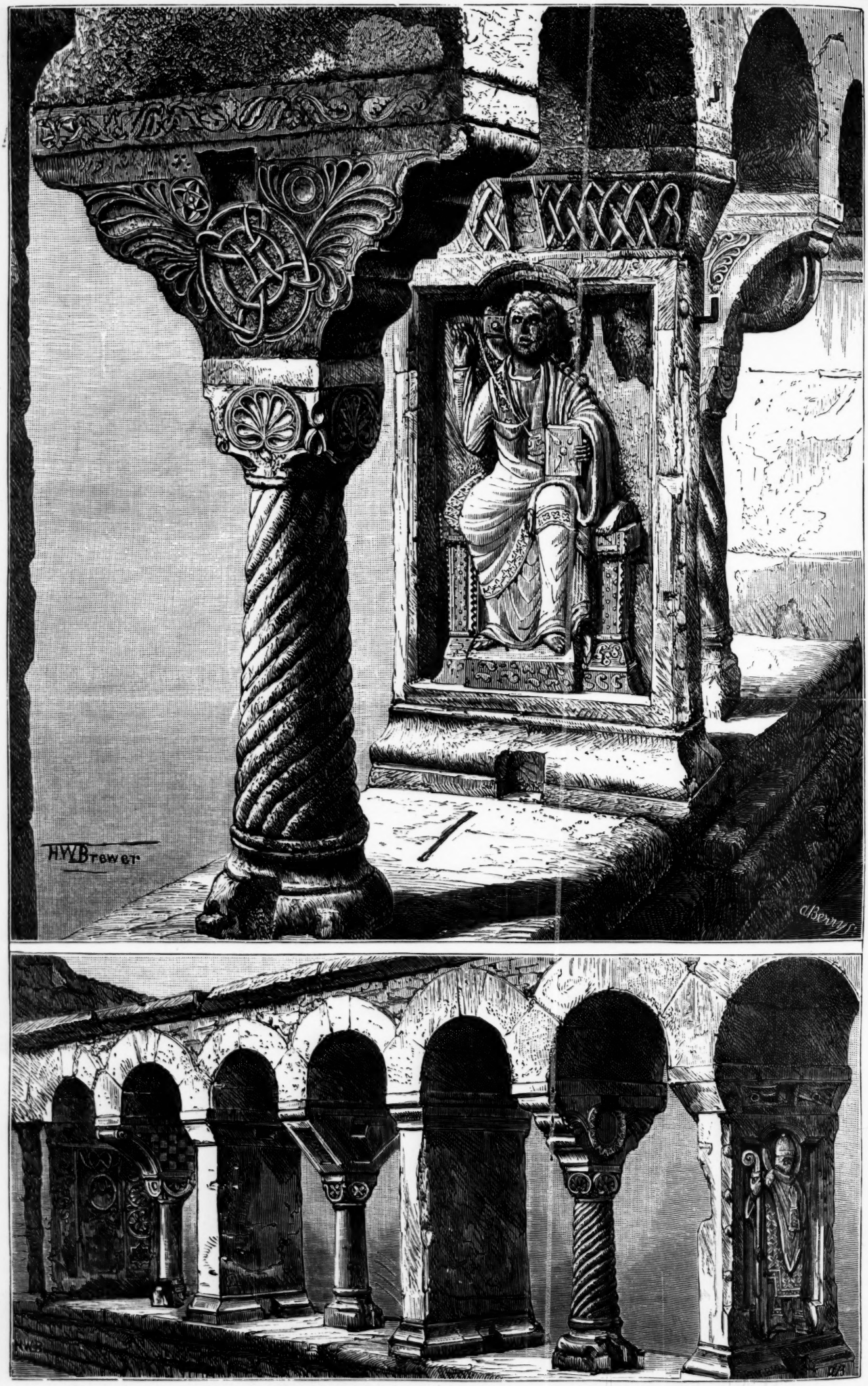
Wren inaugurated a kind of return to old influences, and ecclesiastical architecture, under him, received quite a new impetus. No one can doubt that when Wren rebuilt London he intended to give the City a strongly ecclesiastical character. The great importance of the towers and spires, even of the smallest churches, seems at once to suggest this, and the great mass of St. Paul's, rising far above all the surrounding buildings, gave the city as marked an ecclesiastical character as that possessed by Lincoln, Salisbury, or any of our old cathedral cities. Wren's attempt to revivify ecclesiastical architecture, however, was short-lived, and it fell back to assume quite a secondary position, until Augustus Pugin again attempted to bring it prominently forward. Unlike Wren, who desired to form an ecclesiastical architecture out of the materials supplied by a living style, Pugin boldly proclaimed the living style of his day "abominable," and too degraded for such a lofty and holy purpose, and hence the revival of Gothic architecture, which he never ceased to preach and practise. Now this was a very decided challenge to modern ideas, and Gothic architecture has been, and is even now, in direct antagonism to modern notions of utility and practicability, and unfortunately these practical and utilitarian ideas have by degrees extended beyond objections to Gothic architecture, and have produced a kind of suspicion of architecture altogether! This is a feeling which was simply impossible in olden times, and is so serious a misfortune to the art itself that, until it can be removed, it is impossible that architecture can assume the position which it formerly occupied. Another evil consequence of this suspicious feeling towards architecture is an indifference to ancient remains and examples of the art, and too often a positive desire to see them "improved away." Even in such a town as Nuremberg, which has, perhaps, made better capital out of its ancient buildings than any other town in Europe, that most interesting feature "the many-towered wall," which surrounds the whole city. is by degrees disappearing, and this most valuable series of examples of Mediæval military architecture will in a few years have ceased altogether to exist.

Particular interest attaches to the Nuremberg fortifications, because it is known that Albert Dürer was in some way engaged in their design. Whether absolutely as architect or not is uncertain, though it is asserted that some of the towers were erected from his design. We should, however, be inclined to think that Dürer would only have been consulted as a kind of adviser. It is, however, impossible to say. We know that Chaucer the poet acted as "clerk of the works" at Westminster Hall, and if a poet could be clerk of the works in one place, why should not a painter be appointed architect in another?

* See Mahaffy's "Social Life in Greece."

LIVERPOOL EASTERN DISTRICT POST-OFFICE.

This building is being erected to meet the increasing requirements of the eastern portion of the city. The principal object was to obtain a sorting-room of the largest dimensions that the site would permit, and also so to arrange the buildings at the rear as to admit of further extension in an economical manner, should it be found necessary. The site is of red sandstone, and excavations have therefore been confined to moderate limits. In the basement accommodation is provided for boy messengers, batteries, linesmen, men's and boy's lavatories, &c., stores, and coals; on the ground-floor, in addition to the sorting-office, there is a large public office, retiring-room for female clerks, room for letter-carriers, and bag-room; and on the first floor there are rooms for the caretaker, inspectors, and others. The materials used for the elevations are Stourton stone and Ruabon red bricks; the doors and windows of the public office being of wainscot. The sorting-office will be heated by hot water, and the public office by ventilating-stoves. Mr. Henry Tanner is the architect.



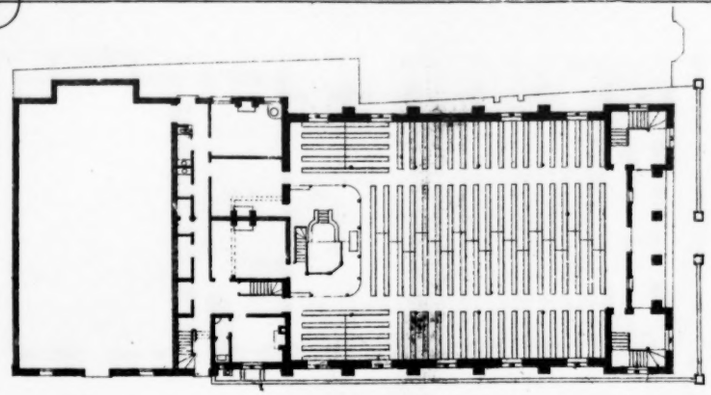
CLOISTERS RECENTLY DISCOVERED AT WÜRZBURG.

THORPE BUILDINGS, BRADFORD.

THOS. C. HOPE, ARCHITECT,
KIRKGATE, BRADFORD.

Whiteman & Bass, *Photo-Litho*. 23E, High Holborn.

Wyman & Sons, Printers, 74 Queen St.



GROUND PLAN

SCALE OF FEET

J. HOLLAND BUILDER
POPLAR

W. ALLEN DIXON, ARCHITECT
37, WALBROOK E.C.

C.F. Kell, Photo-Litho. Castle St Holborn, London, E.C.

POPLAR & BROMLEY TABERNACLE.

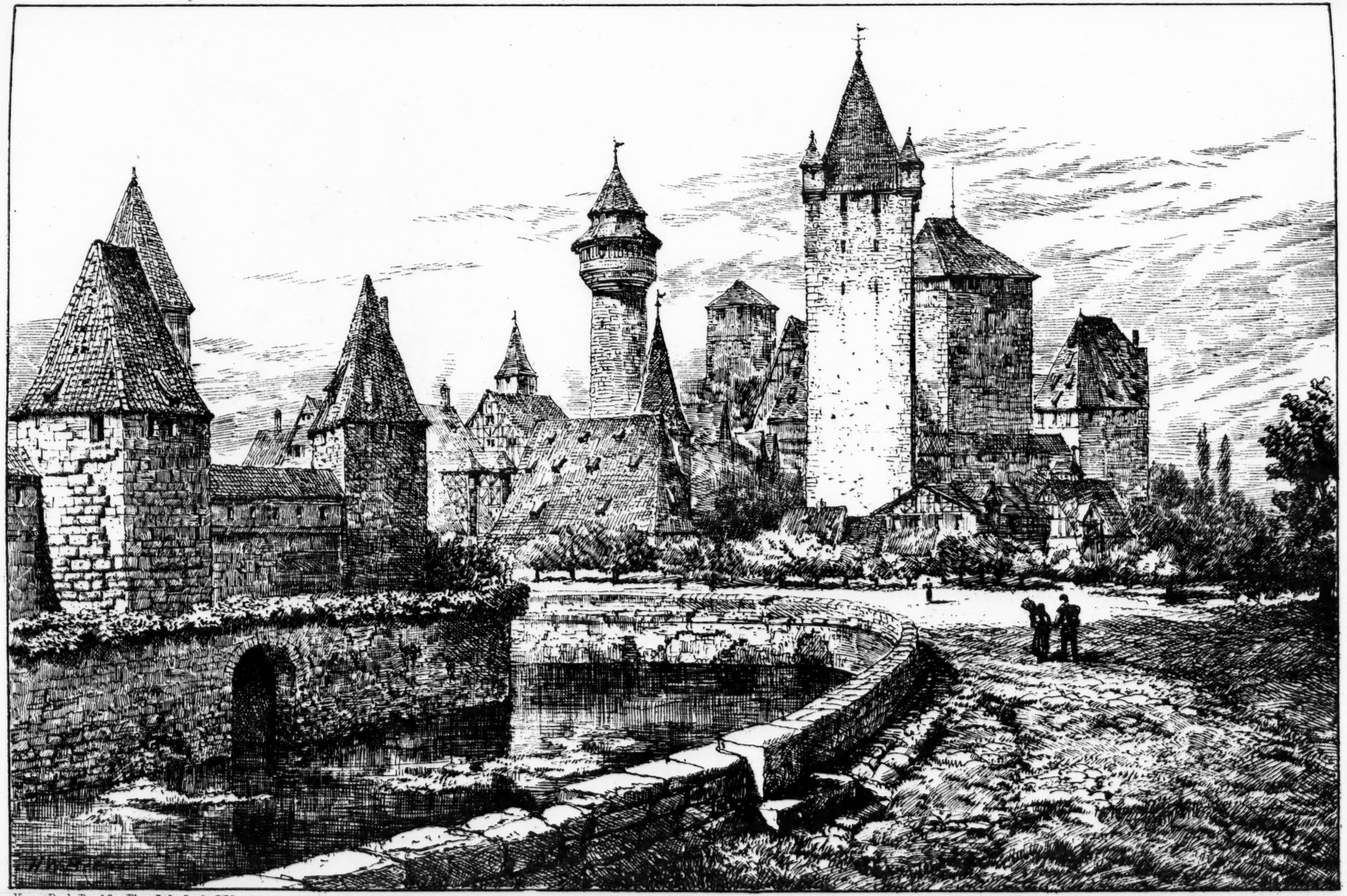
THE REV^D W. LAMBOURNE MINISTER

Wyman & Sons, Printers, G^t Queen S^t

THE REV. W. CARROANE WINTERS

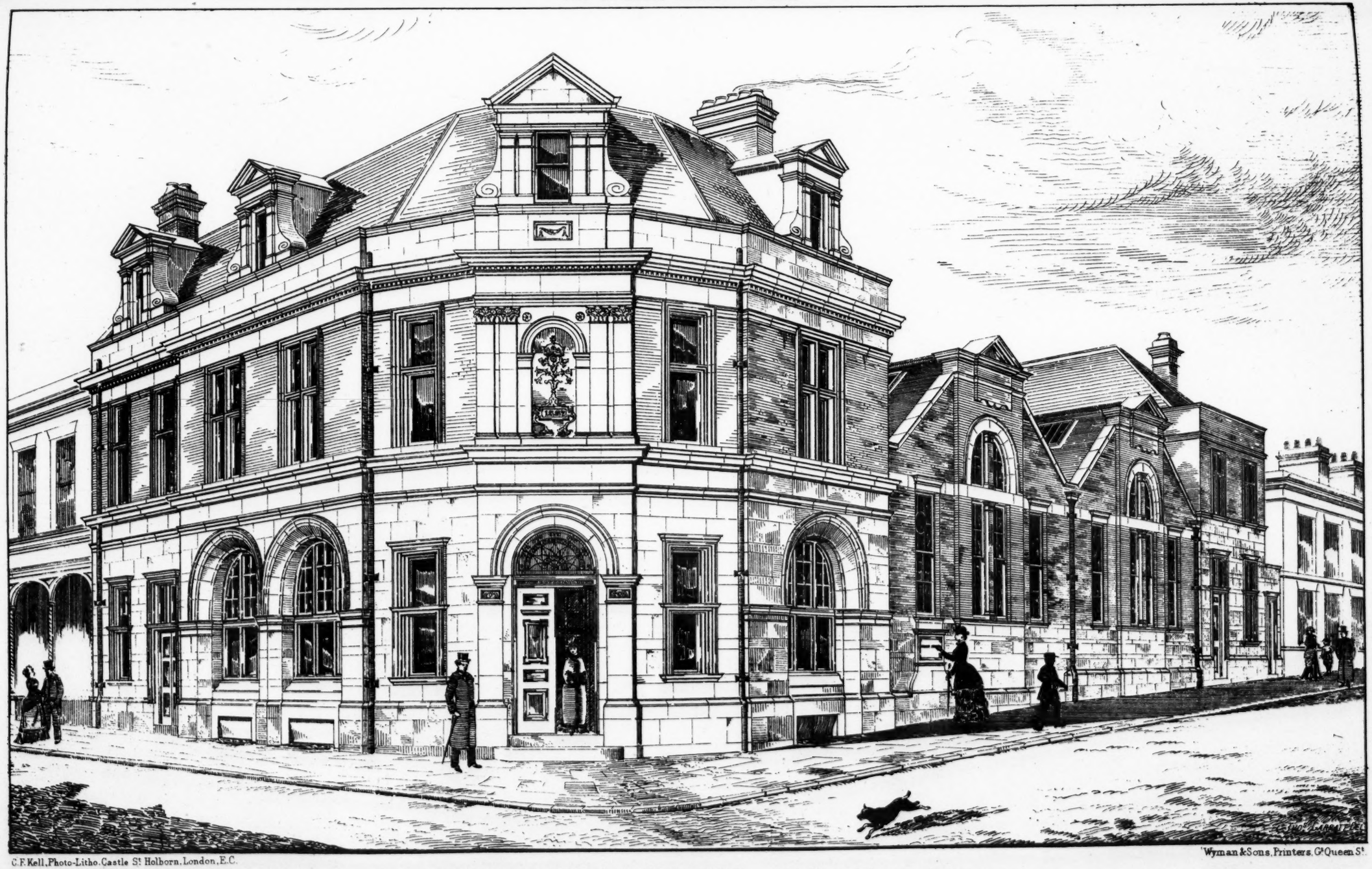
Vincent Brooks, Day & Son, Photo-Litho., London, W.C.

TERRA-COTTA GROUP.—By Messrs Stiff & Sons.



Vincent Brooks, Day & Son, Photo-Litho., London, W.C.

THE WALLS OF NUREMBERG.



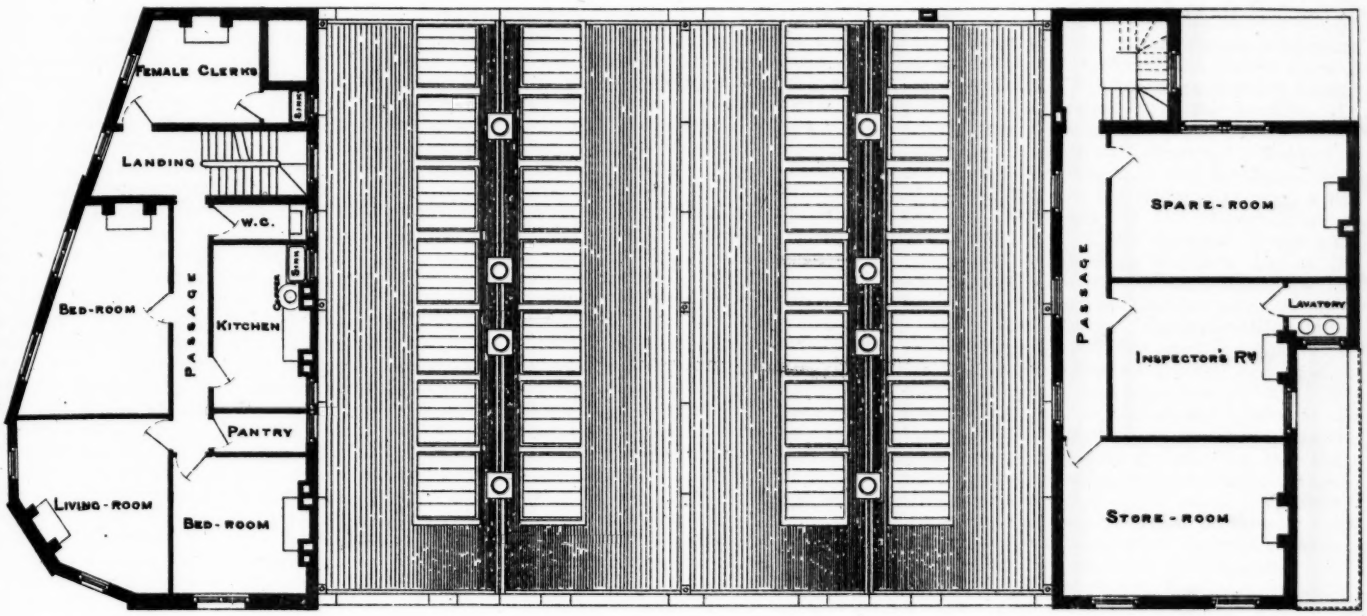
C.F.Kell, Photo-Litho. Castle St Holborn. London, E.C.

Wyman & Sons, Printers, Gt Queen St.

LIVERPOOL EASTERN DISTRICT POST OFFICE.—MR. HENRY TANNER, ARCHITECT.

— LIVERPOOL POST OFFICE —

— NEW OFFICE FOR EASTERN DISTRICT. —



— PLAN OF FIRST FLOORS —

— GROUND PLAN —

10 5 0 10 20 30 40 50

C.F.Kell, Photo-Litho. Castle St Holborn, London, E.C.

Wyman & Sons, Printers, Gt Queen St

ARTISANS' DWELLINGS AT HORNSEY.

THE NOEL PARK ESTATE.

On Saturday last the Earl of Shaftesbury attended at the opening of the Noel Park Estate, near Hornsey, and laid the memorial or corner stone of one of the many new streets of workmen's dwellings in what is designed to become, in five or six years' time, a town of about 2,600 houses. Some two or three hundred houses are at present ready for occupation, and many more are in a forward condition. It is not necessary that we should devote much space on the present occasion to a description of the houses, for, on the 30th of June last, we published a detailed description, accompanied by a block plan of the estate and views and plans of the five classes of houses which will be erected on it. Suffice it to say, then, that the estate is about 100 acres in extent, and has frontages on Lordship-lane and on Green-lanes, Wood-green. The Green-lanes station of the Great Eastern Railway is actually on the estate, while the Hornsey and Wood-green Stations on the Great Northern Railway, and the Green-lanes Station of the Midland Railway, are each within a few minutes' walk of the estate. The rents of the houses (including all rates and taxes) range from 11s. 6d. for the first-class houses (which contain eight rooms) to 6s. per week for the fifth-class houses (which contain four rooms and a washhouse). The brickwork is sound, and put together with good mortar, and special attention has been paid to sanitary arrangements. No drains pass beneath the houses, and all sinks are disconnected from the drains, and discharge into the open-air over trapped gullies. A bed of concrete is laid over the whole of the site of each house. The Company has two other large estates in the suburbs, namely, the Shaftesbury Park Estate, at Battersea, with 1,200 houses; and the Queen's Park Estate, Harrow-road, with 2,170 houses. It is claimed,—no doubt, correctly,—that the houses on the Noel Park Estate at Hornsey exhibit in many respects an advance on those on the Shaftesbury Park and Queen's Park estates, but one of the speakers at Hornsey on Saturday last made a remark which it was encouraging to hear, viz., that the company hoped to see their way to still further improvements on future estates which they hope to cover with workmen's dwellings,—that the goal has not yet been reached, either in the extent of their operations, or in the perfection of the dwellings which they are building. The Hornsey estate, as a whole, will compare favourably with any workmen's colony that we know. Its usefulness, and, therefore, its prosperity, will obviously largely depend upon cheapness and facility of access to and from town, and we understand that negotiations are in progress with the several railway companies with the view of obtaining cheap periodical or day tickets for the inhabitants of the estate. The buildings on the Noel Park estate are being erected from the plans and under the superintendence of Mr. Rowland Plumbe, of Fitzroy-square. The company purchase all materials, and let the labour in the respective trades, the immediate supervision of the work being entrusted to Mr. Wheeler, under the general direction of Mr. R. E. Farrant, the Deputy Chairman of the company. It is expected that within four or five years the land will all be covered, and it is intended to build a very large proportion of fourth and fifth class houses in order to meet the great demand among the poorer members of the industrial classes for houses which they can afford to occupy without the necessity of taking in lodgers.

Lord Shaftesbury, in addressing the large assembly (over which Mr. Ernest Noel, M.P., the Chairman of the Company presided), remarked that thirteen years had elapsed since he laid the first stone at Shaftesbury Park. Great benefit had resulted from that undertaking and others of the same kind in connexion with the domiciliary condition of the working-classes of the metropolis. Suburban towns like that of Noel Park, where a large mass of people might live in health and comfort, greatly helped, he maintained, to enable artisans and labourers to perform their daily work with cheerfulness and efficiency, and were indirectly beneficial to the whole community. After earnestly appealing to working men to discountenance sensational acrobatic performances, which led, he said, to horrible cruelties in the training of children who were employed in them, his lordship said he hoped and trusted that those who lived in the Noel Park Estate would have secured to them the enjoyment of the Alexandra Park. He believed that the Corporation of London would come to a determination to purchase that Park, and keep it as an open space for recreation and amusement for the great mass of the working people. He knew that they would turn it to good account. Open spaces they must have for the vast seething population of London; and open spaces, with the blessing of God, they would have. In conclusion, the noble earl expressed his great satisfaction that gin-palaces and public-houses were to be treated by the owners of that estate as the ancient Hebrews treated the lepers,—that was, kept outside the walls.

Sir Wilfred Lawson, M.P., moved the following resolution:—"That this meeting rejoices at the progress made by the Artisans', Labourers', and General Dwellings Company in providing healthy homes for working people, congratulates the shareholders on the commercial success which has attended the company's efforts, and commends its extended operations to the support of all interested in the welfare of the industrial classes." The hon. baronet alluded to the testimony given by Lord Beaconsfield at the opening of Shaftesbury Park, that that company had solved the problem how to give working men comfortable and happy homes, adding that that was valuable testimony from such a man.

The Hon. Evelyn Ashley, M.P., in seconding the resolution, expressed his belief that the opening of that estate was not to be regarded as the goal of the company's enterprise, but that its operations would be still further extended, especially as its work had proved commercially successful, and as a former director he testified that the Board well deserved the confidence of the public.

Mr. N. Story Maskelyne, M.P., supported the resolution, and it was adopted.

Mr. R. E. Farrant (deputy-chairman of the Board) mentioned the names of several noblemen and others who had written to express regret that they could not attend the opening. The Archbishop of Canterbury wrote as follows:—"I assure you of my sympathy with the work which the Artisans' Dwellings Company is attempting in the important direction of improving the homes of the working men. No one who cares for our labouring population can doubt that this is one of the first, perhaps the most necessary, steps for their good." Mr. Farrant added a few words in kindly recognition of the conscientious way in which the workmen employed by the company did their work.

Mr. S. Morley, M.P., said he had great pleasure in moving "That the best thanks of the meeting be given the Earl of Shaftesbury, K.G., for his presence to-day and his continued interest in the operations of the company." As a former director of that company, he was glad to be able to bear his testimony to the business-like and admirable conduct of the present directors, who could not pay more attention to the duties of their office, or display more intelligent interest if they were working for themselves only, instead of exerting themselves on behalf of hundreds of fellow-shareholders. Now, he knew that on estates like that just opened a large number of persons paid good rents; but he wanted to see dwellings erected for the immense mass of people who really could not afford to pay such rents, and he thought the building of houses for those who could only pay half the rents which would be obtained there would be a great public benefit. Having lately visited some houses of the class called "tenement houses," he had found cases in which a whole family were living in one room under conditions which were quite un-English, and were morally and physically degrading, and that evil was one which ought not to be allowed to go on without strong efforts being made to remedy it. He would venture to endorse an opinion which he saw expressed the other day, that a Government which had offered to lend money to construct a second Suez Canal at 3½ per cent. might fairly be asked to advance loans, on good security, for the purpose of helping to supply the deficiency to which he alluded.

Mr. Sheriff Savory, in seconding the resolution, alluding to the scheme of purchasing the Alexandra Park, said he might venture to remark that Lord Shaftesbury's presence before the Corporation to advocate the purchase, and the few words which he uttered, carried the petition which was presented on that occasion.

The motion was passed by acclamation, and with a few words of acknowledgment from Lord Shaftesbury the proceedings terminated.

The band of the Scots Guards played at intervals up to eight o'clock, and refreshments were provided for the 3,000 persons who were present, the workmen and their wives, to the number of about 1,200, sitting down to tea in an enormous tent.

NOTES FROM THE WEST.

The annual report of the Bristol Trades Council says, "The relations between capital and labour throughout the country are in a somewhat unsettled state. In a few instances a substantial increase in the rate of wages has been obtained, while in others it has been impossible to resist a reduction. Official statistics of the general state of the country are, on the whole, reassuring, notably in the production of manufactured commodities, which show a larger amount of business than at many former periods." Referring to local matters, the report says, "We have enjoyed a comparative immunity from trade disputes." Regret is expressed in the document that Mr. Broadhurst, M.P., had failed in his attempt to carry a Bill through Parliament for the improvement of the condition of those engaged in the nail, chain, and bolt-making districts, and at the unsuccessful endeavour of Mr. Burt, M.P., to amend the Employers' Liability Act.

At the last meeting of the Bristol Chamber of Commerce, a paper was read by Mr. W. D. Wilcox, on the Channel Tunnel, and he then moved the following resolution:—"That this Council declines to discuss the merits of the Channel Tunnel scheme in its bearings on the commerce of this country, believing that there exist reasons of paramount political importance which demand the abandonment of the project." An amendment was proposed in favour of the tunnel, and eventually it was decided to further consider the subject at the next meeting.

A new mission church has been opened at Barton Hill, a densely-peopled suburb of Bristol, where, a few years ago, there was nothing but fields and market gardens. The style adopted is Early Decorated, and the church has been substantially built of Pennant stone with freestone dressings. The building affords accommodation for 250 persons. Messrs. Wilkins were the general contractors. In the same district, a new church, to accommodate 600 persons, is being built from the designs of Mr. C. F. Hansom.

A new cemetery has just been opened at St. George's, Gloucestershire. It cost 4,500*l.*, about half of which was for the buildings, which are chiefly in the Early Gothic style. Mr. H. J. Rossiter was the builder, and Mr. W. H. Price prepared the plans. The cemetery provides for 10,000 graves.

Complaints have been made in the neighbourhood of Newpassage that the Severn Tunnel operations have drained the district of its water supply. A meeting of the inhabitants has been held to see what could be done, and it was resolved to ascertain if the contractor had not, in his contract with the Great Western Railway, undertaken to keep good the water supply during the tunnelling operations, and, if no such clause existed, that counsel's opinion be taken on the point.

A Mission Church is about to be opened in the Marshes-road, Newport. It has cost 800*l.*, and will seat 250 persons.

A Bible Christian Chapel for 550 worshippers, with schoolrooms for 500 scholars, has lately been opened at Newport. The former building became unsafe and was condemned. The cost of the new structure (which was the work of Mr. W. Blackburn), exclusive of old material, was 1,800*l.*

A proposal has come before the Cardiff Corporation from the South Wales College Committee asking them to acquire the old Infirmary, which, with the site, could be had for 10,000*l.* for their purpose. The Corporation considered that in addition to the position of the building being bad, its walls were likely to be impregnated with the germs of disease, and it was therefore most unsuitable for class-rooms.

The Cardiff School Board has, since it came into existence, provided no fewer than 7,437 school places in nine schools. Voluntary schools accommodated, when the Board commenced work, 7,186. The board are proposing to erect another school to accommodate 800 children. The rate for school purposes amounts to 2d. in the pound.

Messrs. Nelson, of Carlisle, will be for several years occupied with the New Roath Dock, Cardiff, which is being constructed at a cost of half a million of money. The water area will be 35 acres. The length of the dock will be 2,400 ft., and the width 600 ft. The depth of water varies with the height of the tide from 25 ft. to 35 ft. The entrance-lock will be 600 ft. in length between the gates, and 80 ft. in width. The depth of water over the cills will be 30 ft. at ordinary spring-tides, and 26 ft. at neaps. Timber ponds are to be formed at the north side of the dock, and these will cover an additional 18 acres. Special means are intended to be taken for loading the ships. By means of hydraulic cranes coal-wagons will be lifted and swung round over the vessels and their contents discharged into the holds. It has been estimated that 2,225,000 cubic yards of material will have to be excavated, and 250,000 cubic yards of masonry will be required in the docks. Pwllypant stone will be used. When this large undertaking is completed the Bute Docks will be increased to 113 acres.

A Church Institute was opened at Widcombe, Bath, on the 27th ult. The building is in the Domestic Gothic style of architecture, and is of Bath stone with black pointing. The lecture-hall accommodates about 400 people, and various convenient rooms are attached to the building. Messrs. Wilson, Willcox, & Wilson were the architects, and Mr. B. Smith, of Widcombe, the contractor. The contract was for 1,400*l.*, but the cost exceeded this amount.

The new Local Board at Swindon are discussing street improvements which would cost 10,000*l.* House-building is going on vigorously in the district.

The memorial stones of a Wesleyan Chapel at Redfield were laid a few days ago. The new chapel will be built according to plans prepared by Mr. Robert Curwen, of Palace-chambers, London, and will accommodate 760 persons. The total cost, including the site, will not exceed 3,000*l.* The style of the new chapel is Geometrical Gothic. The building occupies a corner site. The west front is to be composed of a central gable, pierced in the ground stage with a richly-moulded central doorway, having a pierced and sunk tympanum. The first stage is to be divided from the second by two moulded strings. The gable will be pierced by a four-light traceried window, the angles are to be buttressed and pinnacled, and the gables will be coped with moulded coping, and surmounted with a carved finial. The west gable is to be flanked with a porch on either side, set anglewise on plan. The doors are to be the same in size and detail as the central door, but are to be without the tympanum. The porches will have pinnacles at the angles, and the gables will be coped with moulded coping and carved finials. The spandrels formed by the apex of the west gable and two porches are to be diapered. The west gable is to stand well in front of the body of the chapel proper, and will bear somewhat the appearance of chancel and side aisles. The fronts of these so-called aisles overlooking the porches are to be pierced by two-light traceried windows. The sides of the chapel are to be divided into bays by buttresses, each bay being filled with two two-light traceried windows, divided by sunk panels, and arranged one over another in two stories. The whole of the elevations will be tied together, and made into one harmonious design by moulded strings, plain bands, plinths, &c., of wrought stone. Mr. Wm. Church, of Bristol, is the contractor.

A fine group of buildings, designed by Mr. A. W. Blomfield, M.A., in conjunction with Mr. A. E. Street, M.A., on the eastern side of the quadrangle of Marlborough College, is near completion. It is said that the work cost about 10,000*l.* Messrs. Stephens & Bastow, of Bristol, are the builders.

Painswick Congregational Church is undergoing improvement, and new schoolrooms are being added. The estimated cost is about 1,500*l.*

Social.—On Saturday last Messrs. Bangs & Co., of Bow, invited their clerks and foremen, numbering some forty, to dine with them, as is their annual custom, at the King's Head, at Chigwell. Mr. Bangs occupied the chair, and Messrs. Lambert and Poston, the vice-chairs, and a toast to the health and prosperity of the firm was drunk with enthusiasm.

THE DISCOVERER OF GAS.

Sir,—It has often appeared to me somewhat peculiar that while substantial memorials in various forms have been erected to perpetuate great names associated with the application of steam power to the propulsion of industrial machinery and railway and marine engines, no single public monument exists to commemorate Mr. Murdock, the discoverer of gas, which has proved so enormous a convenience and source of wealth to the civilised world.

Men of scientific eminence have signified to me their willingness to assist in giving effect to a scheme for publicly recognising the incalculable services of Mr. Murdock if the leading gas companies could be induced to head a movement for the purpose. I have submitted the proposal to the President of the Gas Institute, and he has considered it of sufficient importance to bring the matter before the council of that body. The President writes me as follows:—"The council feel that great honour is due to the memory of Mr. Murdock for the work he performed in assisting to lay the foundation of our great and growing industry, which probably even now has far exceeded any anticipations he ever formed of the importance of his work." At the same time the President states that the scope and powers of the Institute, as a society chiefly of a scientific character, do not admit of the council taking official action in initiating the undertaking.

A circumstance may be mentioned which renders the proposal specially opportune at the present moment. The commodious house erected and long occupied by Murdock,—the first dwelling ever lighted by gas in the world,—is threatened with imminent destruction. At this residence he developed and perfected his invention, and here is still to be seen some portion of the primitive apparatus with which he conducted his experiments. The first great exhibition of the fruits of his labour was on the occasion of the rejoicings at the Peace of Amiens in 1802, that event being celebrated by the illumination of the famous works of Doulton & Watt, at Soho, Handsworth, and it is stated that these works were subsequently connected by pipes with Murdock's house at Sycamore Hill in the same locality. The house is very strongly built and of good elevation, although the extent of land originally surrounding it has been considerably curtailed. A dozen years ago I paid frequent visits to the place, and am sorry to learn within the past fortnight that the present owner has laid out the grounds for the erection of suburban cottages, and that the execution of the plan would involve the early demolition of this historic relic, which would have been razed some years since but for accidental circumstances.

The house would be very suitable for an International Gas Museum, or the head-quarters of the Gas Institute. The drawing-room is large enough for a reading-room, and the building could easily be adapted for a public institution. I have reason to believe that the proprietor, if formally approached and the proposed scheme were explained to him, would modify his plan, accept very moderate terms for the house, and reserve a few acres in front of it from the land he is covering with buildings. If a fund were started I should be glad to contribute my mite to the undertaking, and to co-operate in worthily perpetuating Murdock's memory.

M. Macfie.

Highbury Quadrant.

THE NEW OBSERVATORY AT VIENNA.

This building, which was opened in June, was designed (according to the ideas of the late Herr Von Littrow, the astronomer) by Fellner & Hellmer, a firm of Vienna architects. It was commenced in 1874, and the external portion was finished in 1878. The fitting-up of the interior has occupied the remaining period, the arrangement of the great refractor having been attended with unexpected delay. The site is eleven acres and a half in extent, and the building is in brick work, in the style of the Early Renaissance. The general design of the building and its adjuncts is in the form of a cross, there being a large cupola in the central portion. The living-rooms face the south, this arrangement being intended (on account of the prevailing north wind) to prevent smoke, &c., from being driven in the direction of the instrument rooms.

THE ROYAL ARCHÆOLOGICAL INSTITUTE.

MEETING AT LEWES.

Sussex was last week the scene of the annual congress of the Royal Archæological Institute, Lewes, the county-town, being the head-quarters of the meeting. On their last visit to Sussex, thirty years ago, the members of the Institute made Chichester their base. Last week's meeting does not appear to have attracted a very large number of members and visitors.

The congress opened on Tuesday, the 31st ult. (as we have already briefly mentioned), when the members were formally welcomed to the county town by the Mayor and Corporation. This took place in the large Court of the County Hall. The Mayor (Alderman Crosskey, M.D.) offered a cordial welcome to the Institute, paid a sympathetic tribute to the loss it had sustained in the past year by the death of its President, Lord Talbot de Malahide, and then called on the Town Clerk (Mr. Montague S. Blaker) to read an address voted by the Town Council. In this the Corporation expressed the lively satisfaction felt by the inhabitants in welcoming the Society to a field of action worthy of its distinguished acquirements. When Mr. Blaker had finished reading, the Mayor offered the address for the acceptance of the Institute, and it was received by Colonel Pinney, as its representative, the gallant Colonel explaining that Sir Sibbald Scott was to have presided, but was kept away by the sudden and serious illness of his son, whilst, as the election of Lord Percy to succeed Lord Talbot as president had not yet been confirmed by the Council, the Institute was temporarily without a president. On the part of the Institute, however, he thanked the Mayor and Corporation for the cordial welcome which had been given to the Institute, a kindness and cordiality which had not been exceeded in any of the many towns which it had visited. Saying which, Colonel Pinney vacated the seat of honour in favour of the Earl of Chichester, an excellent nobleman who, he said, was not only a distinguished archæologist, but was esteemed and beloved by almost every man, woman, and child in the county. The noble Earl, in the course of his address, which was intentionally a brief one, said it was sometimes urged that archæology was a worn-out science,—that they had, as it were, worked out those rich veins of ancient monuments and relics which, at the commencement of the work, were so interesting and full of historical illustrations; but, though no doubt some of them had been worked out, he was sanguine enough to believe that there still remained, though, perhaps, hidden in strata more difficult to work, plenty of rich ore to reward the skill and industry of explorers. Archæology might help us to understand the inner life of our forefathers; whilst they should bear in mind that the chief use of all history was to give a correct knowledge of the deeds and characters of our forefathers, in order that we might learn, both in private and public life, to imitate their virtues, and avoid their faults and their blunders. Nothing, perhaps, was so useful for this purpose as the private or semi-official correspondence of eminent persons. But private correspondence, especially in England, was not of a very ancient date; for before the fifteenth, perhaps one might say the sixteenth, century, few even of the higher classes were able to write at all. Mr. Hallam instances, as the earliest specimen of female epistolary correspondence, the letter of Joan to her husband, Sir John Pelham; a letter written from Pevensey Castle to Sir John, who had recently landed in the north with his old master, Henry IV. Mr. Hallam added, "without," said the Earl with a smile, "sufficient respect to my distinguished ancestress," that, "Judging from the bad spelling and composition, the letter is probably genuine." Lord Chichester then touched on some of the work of the Sussex Archæological Society, and adverted to the unearthing of the venerable Clunaic priory at Southover by the navvies of the London and Brighton Railway Company, resulting in the discovery of the remains of William de Warenne and his wife, Gundreda, daughter of the Conqueror, and concluded by observing that the study of the past history of the English people must produce in every well-ordered mind a deep feeling of thankfulness to the good providence of God for the many

blessings which, as Englishmen, we now enjoy, a feeling of thankfulness that our lot has been cast, not in the Middle or earlier Ages, but in the peaceful and prosperous reign of our good and gracious sovereign, Queen Victoria.

After the President's address, the members of the Sussex Archæological Society took luncheon in a marquee erected on the bowling-green in the castle grounds, a large company sitting down, under the presidency of the noble Earl, who, after luncheon, proposed the customary loyal toasts.

Afterwards, the company moved to the gateway of the Castle, where Mr. G. T. Clark drew attention to the chief features of the building. The gateway, he pointed out, was the original Norman gateway, and was a very good specimen. There was no portcullis; it was simply a door, a mere hole in the curtain. Inside the gate, there was probably at one time a gate-house, of which the wall on the right-hand side represented the old wall, whilst that on the opposite side corresponded with it, helping to form a sort of parallelogram, something similar to that to be found, among other places, at Pevensey and at the Château d'Arques, near Dieppe. Going through the gateway, they found the barbican, added probably in the time of Edward I., and consisting of two parallel walls, whilst at the end was another gate-house, something like that seen at Carlisle. They would observe, what was rather rare, that there were two portcullises, close together, and, moreover, on the inside of the wall. There was another feature which could be seen by going to the top of the tower, namely, the machicolations in the roof outside the gate, intended to drop missiles through. These were on the platform of the roof, and, usually, they were holes in the floor; but here there was a parapet as if to prevent anything or anybody falling through by accident. He had not seen such an arrangement elsewhere. Passing up the steps, Mr. Clark pointed to where the foundations of a small square tower had recently been found, on the walls, or curtain, of the castle. Then, reaching the keep, he remarked that though there was not much left of the castle, it was a very curious and interesting example, which threw much light on the construction of such buildings. The style of fortification in use in England, and in Normandy as well, before the Conquest was, he said, very simple as well as effective. The practice was to throw up a mound, or to take advantage of a natural mound, and round this to form a ditch, which was often the parent of the mound. This made the keep, or citadel; and from the ditch, or moat, was carried a ridge or bank enclosing so much ground as a court, appendage, or bailey of the citadel. Sometimes the mound stood in the centre of this court; more frequently, as in this case, at the edge of the circuit; whilst at Windsor the court was like an hour-glass in shape, with the mound in the narrowest part. Here, the court was an oblong, with the mound at one end of the enclosure. Although masonry, by which he meant stones and mortar, was at that time used in churches, it was employed very little in works of fortification, partly owing to the mounds, such as were artificial, being ill-calculated to support the weight; in fact, so far as he knew, there was only one military building in England, except Roman buildings, in which masonry was used before the Norman Conquest. Arundel Castle had been mentioned in Domesday as existing before the Conquest; but, unless it were in the vaults or in parts of the castle not generally seen, he had failed to find any part of it of an earlier date than the Conquest. In short, when the Conqueror came from Normandy, he left very few castles in masonry behind him, and he found still fewer in England. There was no evidence that he found any at all. The defensive works before that time were of timber, triple rows of palisades, behind which the people withdrew in time of war. After the Conquest, when the Conqueror had distributed his great Barons over the land, the works in masonry began. The old fortifications were kept until the new could be substituted, and the castles were placed on the mounds, as representing the centre of the estates. For this reason, the square keep, of which the Tower of London was the type, was for the most part older than the shell-keep, which usually belonged to the late rather than to the early Norman period. In some few cases, as at Arundel, it appeared to be early, and so again at Lewes. As to the fortification of the court, there was usually one citadel. There were obvious inconveniences in having more; and the practice was to concentrate all the forces upon one single keep. Here, at Lewes, Nature had provided two mounds, and the Norman who came to fortify it took one mound as his keep, but, as he could not leave the other, the Brack mound, undefended, fortifications were also placed there, though subordinated to the keep in which they were then standing, where the walls were Early Norman.

Leaving the Keep, the visitors passed to the edge of the Castle mound, where, in sight of the Brack mound, covered with trees in the full luxuriance of their midsummer foliage, and in the open air, the Rev. W. R. W. Stephens read a paper on the Battle of Lewes, after which some of the party drove to the scene of that historic encounter, whilst others went to the Church of St. John at Southover. Here Mr. Somers Clarke, jun., directed notice to the massive cylindrical columns, which he regarded as proving the high antiquity of the church. Here the visitors were shown the exquisite little chapel in the Norman style erected by subscription in 1847 as a resting-place for the remains of William de Warenne and his wife, whose bones, enclosed in two leaden cists, measuring less than 3 ft. were found, as stated by the Earl of Chichester in his opening address, in the Priory ruins. On one of the cists the word "Gundrada" was plainly visible. The chapel is lighted by three windows, filled with painted glass, showing De Warenne, Gundredra (the founders of the Priory), and St. Pancras (its titular patron saint). Passing from the church, the visitors went on to the Priory ruins, some of the walls of which, as all who have travelled by rail from Brighton to Lewes know, are to be seen from the railway. In fact, it was due to the cutting of the railway that the older ruins were discovered. The Priory was one of the Clunaic order, and is specially remarkable from the fact that large portions of it were twice rebuilt. Recently, a very considerable area having been excavated, it has been proved that many of the apartments were filled in with chalk, to afford foundations for the newer buildings. Thanks to the assiduity of Mr. Somers Clarke, jun., and of Mr. W. H. St. John Hope, sufficient has been explored to enable a tolerably complete plan of the original Priory to be drawn. The second rebuilding dates from 1145, and a record of the destruction of the Priory chapels has been found in a letter written to Thomas Lord Cromwell by one of his agents, telling how he had undermined the walls, supported them with wooden props, and then set the props on fire, when the whole came down. Corroboration of this, said Mr. Hope, had been found in traces left by the fire.

After seeing the Priory, the visitors went to dinner, and in the evening Mr. E. A. Freeman, the historian, opened the Historical Section by delivering an address on the general history of Lewes and the county, dealing specially with the three great sites, the scenes of the three great events which, beyond all others, give the South Saxon land its historic place among the counties of England. With this address, the proceedings of the day ended.

On Wednesday, the 1st inst., the members of the Institute spent the day in an excursion to Pevensey, Rye, and Winchelsea. On their return to Lewes in the evening, the Architectural Section was opened by Mr. Micklethwaite, who took occasion to make a full tilt against "restorers" of ancient buildings, remarking that the first lesson to be taught such men was that their duty towards an old church was not to "restore" but to preserve it, and this would generally best be done by showing them how it came to be what it was; and, secondly, that the marks of age on a building many centuries old were not defects, but honourable scars. A paper was also read by Mr. Hope on the St. Pancras Priory.

On Thursday, the 2nd inst., the party visited Hastings and Battle Abbey, where they had Mr. Freeman as their guide; and in the evening the Mayor of Lewes gave a brilliant *conversazione* in their honour in the County Hall, which passed off most successfully.

Friday, the 3rd inst., was a busy day. It was devoted to the annual meeting of the Institute, followed by the opening of the Antiquarian Section by Major-General Pitt Rivers, and by the reading of nearly a dozen papers on various subjects, from the question of the meaning of the shears combined with clerical symbols on incised gravestones (by the Rev. T. Lees) to an inquiry into the traces of Teutonic settlement in Sussex (by a Brighton member, Mr. F. E. Sawyer), and from some observations by the Rev. W. Powell on the Domesday survey in Sussex to some remarks by the Rev. J. J. Raven on certain Sussex bells.

On Saturday last the members visited New Shoreham.

In connexion with the meeting an interesting collection of objects was got together in the chief room in the County Hall by Mr. R. Crosskey, Mr. A. E. Griffiths, and Mr. Henry Griffith, of Brighton. Most of the articles were connected with the county. Chichester was represented in the collection by a curiosity in the shape of a big globular lantern of horn, in a metal framework, set on a pole. This was called "The Moon," and accompanied the mayor at night through the streets of the city; and probably, when "The Moon" was first introduced, the streets of the city needed all the artificial lighting that could be got. A curious relic with a story attached to it was a silver spoon, close to which was the body of a dead rat, dried like the skin of a mummy. Two centuries ago, so the story goes, this spoon was missed at one of the Lewes inns, and a servant was suspected of the theft, but nothing was proved. The house was pulled down a few years since, and hidden among the ancient timbers was the spoon, with the dead body of the thief,—a rat.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The Fortieth Annual Congress of the British Archæological Association will be held at Dover, commencing Monday, the 20th August inst., and terminating Wednesday, the 29th, which will include extra days, to be passed at Calais (for more than two hundred years, up to Queen Mary's reign, an integral portion of the English kingdom), with excursions to the neighbourhood, probably extending to Amiens, Abbeville, and Boulogne. The Right Hon. the Earl Granville, K.G., has been elected President of the Congress, and intends to be present at the opening meeting at the Town-hall, for the reception of his lordship and the Association by the Mayor and Corporation of Dover, as well as at the public dinner to be given by the Mayor (Mr. R. Dickeson) in honour of the noble president and the Association the same evening.

On Monday, the 20th, members and visitors provided with Congress tickets will assemble at the new Town-hall, Dover, at one p.m., for the reception by the Mayor and Corporation of the President and the Association, and examination of the regalia and muniments, on which Mr. George Lambert, F.S.A., and Mr. W. de Gray Birch, F.S.A., will make some remarks, and the Maison Dieu Hall, under the guidance of Mr. Edward Knocker, F.S.A., hon. librarian to the Corporation of Dover. The party then will proceed to the inspection of St. Martin's Priory, where Dr. Astley will give a history of the remains of the ancient buildings and their recent restoration by the late Mr. Street, R.A. Afterwards, carriages will be taken for the ruins of St. Radigund's Abbey, which will be described by Mr. E. P. Loftus Brock, F.S.A. On returning to Dover, a visit will be paid to St. James's Church, if time will permit, for an inspection of registers, &c., under the guidance of Mr. Edward Knocker. At 7·30 p.m. the inaugural dinner, given by the liberality of the Mayor of Dover to the President and the Association, will take place at the new town-hall.

On Tuesday, the 21st, members and visitors will leave for Deal at 9·10 a.m. by railway, and visit the Castle, then proceed by train at 10·45 to Sandwich, where, under the guidance of Mr. George Dowker, the party will walk to Richborough Castle, and examine its massive Roman remains, Mr. Dowker illustrating them at the same time. They will return to the Bell Hotel, Sandwich, at 1·0 p.m. for luncheon, then proceed to examine the churches of St. Clement and St. Bartholomew, hospice and chapel, as well as the old town-hall and the pictures there, lately presented by the Ashburnham family, relating to the early history of the old Cinque Port; thence to the entrance-gate, near the Fishers' Gate, town walls, &c. They will leave Sandwich by train at 3·50 p.m. for Walmer Station, where carriages will be in waiting for those who have provided themselves with the necessary tickets, and drive to Walmer Castle, which, by the permission of Earl Granville, Lord Warden of the Cinque Ports, will be

visited. Leaving by the same carriages, it is intended to drive to Dover, taking the Church of St. Margaret-at-Cliffe (a fine specimen of late Norman work) *en route*, if time will allow. The first Evening Meeting will be held at the Council Chamber at the Dover Town-hall, for the reading and discussion of papers, at 8·30.

On Wednesday, the 22nd, members and visitors will leave by railway (South-Eastern) at 8·45 a.m. for Westenhanger, and visit the ruins of the castle, known as Fair Rosamond's Bower, close by, and then by carriages, about 10 o'clock, to drive to Lymne, for the examination of the Roman remains there, castle, and church. Then to proceed to Saltwood Castle, which will be described by Mr. F. Beeston, who is restoring it, and afterwards drive to Hythe, where luncheon will be partaken of and the horses refreshed and rested. After luncheon, the church and crypt will be inspected, and then the party will proceed by the same carriages to Cæsar's Camp, on the road to Folkestone, which, if time will permit, will be ascended and explored; if not, the drive will be continued to the Folkestone Railway Station, so as to catch the 6·38 p.m. train to Dover, arriving at 6·54. The second Evening Meeting will be held at the Council Chamber, as before, at 8·30.

On Thursday, the 23rd, members and visitors will leave by a special train (London, Chatham, and Dover) at 9 a.m. for Canterbury, where, after the reception of the party at the Guildhall by the Mayor and Corporation, and examination of the regalia, charters, and other muniments, which it is hoped may be commented on by Mr. E. Maunde Thompson, Keeper of the MSS., British Museum, they will proceed, under the guidance of Mr. J. B. Sheppard, to the cathedral, where the Very Rev. Dr. Payne Smith, Dean of Canterbury, will give an historical account of the sacred edifice, and Mr. Loftus Brock will describe its architectural details, &c. Afterwards, it is proposed to visit St. Augustine's Monastery, by permission of the Warden, and which will be described and commented on by Mr. Sheppard. The return to Dover will be by special train, and in time for the third Evening Meeting at the Council Chamber, at 8·30.

On Friday, the 24th, the members and visitors will leave again for Canterbury by an early train, so as to reach the ancient city about 10 a.m., and then, under the guidance of Mr. Sheppard, visits will be made to the remains of the castle, the city walls on the Dane John, St. Mildred's Church, the West Gate, St. Dunstan's Church, St. Pancras Church, for Roman remains there, and St. Marten's Church. Luncheon will be partaken of at the Rose Hotel, after which, if time will permit, a visit will be made to the Museum. About 3 p.m. carriages will be in readiness to convey the party to Dover, *viâ* Bekesbourne, Patrixbourne (Bifrons), Adisham, through Fredville Park to Barfreston, by permission, the churches of which places will be visited, and described by Messrs. Loftus Brock, George Patrick, and others. The party will return to Dover, by Coldred, in time for the fourth Evening Meeting at the Council Chamber at 8·30.

On Saturday, the 25th, members and visitors at 9 a.m. will walk to the Templars' Church, on the Western Heights, where it is said King John did homage to the Pope of Rome through Cardinal Pandulph, and then, on returning to Dover, proceed to St. Mary's Church about 10·45, which will be described by the Vicar, the Rev. Canon Puckle, M.A. At one o'clock luncheon will be partaken of at the Royal Oak Hotel, the head-quarters of the Congress. At 2 p.m. the party will proceed to Dover Castle, which, by the kind permission of General Newdegate, the General Commanding the South-Eastern District, will be inspected, under the guidance of Mr. Thos. Blashill; and the church and Roman Pharos will be described and commented on by the Rev. Canon Puckle, M.A. In the evening there will be a *conversazione* at the new town-hall, by the courtesy of the Mayor and Corporation of Dover, where the closing meeting will be held, and certain remaining papers read and discussed.

All members and visitors intending to join the Congress and the three extra days' excursion to Calais and its neighbourhood, as already referred to, are requested to send in their names as soon as possible to the Hon. Congress Secretary, Mr. George R. Wright, F.S.A., Junior Athenæum Club, Piccadilly.

EDINBURGH ARCHITECTURAL ASSOCIATION.

SESSION 1882-83.

The Report of the Council refers to the session now concluded as the most successful in the annals of the Association.

The papers have been of a high order, both as regards knowledge and utility, and the Members of Council as well as the Syllabus Committee warmly acknowledge the indebtedness under which the various lecturers have placed them, as they also do their obligation to the proprietors, agents, and custodiers of the many buildings and archæological remains which have been inspected during the session. They have also specially to accord their thanks to the Honourable the Board of Manufactures for granting the use of the National Galleries on the occasion of the Architectural Exhibition, as also to Her Majesty's Treasury for confirming the arrangement. With regard to the exhibition, which was opened with an evening *conversazione*, it may be stated that the contributions, both as regards number and merit, vastly exceeded the most sanguine expectations. Exhibits were received not only from all the great centres of architectural art, but also from many of such private collections as contained the works of deceased or ancient masters. The scheme was so hurriedly and somewhat unexpectedly developed that time proved slightly insufficient in which to interest the outside public, and the season of the year was such that the galleries were required to be vacated apparently at the very moment when the citizens of Edinburgh became alive to the importance of the collection in their midst, and unfortunately just too soon to prevent the receipts from entirely covering the whole requisite expenses. The accounts are not yet quite adjusted, but the slight deficit will be liquidated without expense to the Association.

During the session volume iii. of the Sketch Book has been issued, and arrangements made for the publication of volume iv. The Committee have been encouraged by the success attending the publication of the Sketch Book to venture upon improvements in the forthcoming volume, which will very much increase the value of the work. It is intended to produce about one-half of the plates by means of photo-lithography instead of by the ordinary process of lithography, as previously employed. Another improvement will be the introduction of letter-press in description of the plates.

With reference to the membership the society has great reason to congratulate itself. At the beginning of the financial year the members numbered 139, while now there are 235 on the roll. The names of eleven old members were during the year withdrawn, while 137 gentlemen were proposed, balloted for, and duly admitted. The numerical gain during the session is 96.

The council are happy to be able to announce that several new and important features will be added to the proceedings of the Association during the ensuing session. Besides the ordinary fortnightly papers a series of lectures on "Early Christian Art" has been promised by Professor Baldwin Brown.

There will also be inaugurated two classes for the study of construction and design, which will be worked upon the lines of similar classes carried on by the London Architectural Association and the Royal Academy.

THE NEW SHIRE HALL, SHREWSBURY.

A portion of the Shropshire Shire-hall has been re-opened for the transaction of public business. From plans prepared by Mr. T. M. Lockwood, architect, of Chester, the buildings have undergone an almost entire reconstruction. Built much upon the same lines as the courts at Chester, of which also Mr. Lockwood was the architect, the reconstructed Assize Courts at Shrewsbury will bear favourable comparison with many in the kingdom. The contractor, Mr. Samuel Warburton, of Manchester, has carried out the work. Mr. Warburton's foreman-superintendent was Mr. Harry Rowland, Mr. J. S. Ham being the clerk of the works, and proving himself an able lieutenant, and Mr. B. Healey being the foreman-in-charge. The fittings have been supplied by the general contractor, and the furniture and judges' canopy by Messrs. W. & F. Brown, of Chester; the tesselated pavement of the corridors by Mr. Oppenheimer, of Manchester; the stained glass ceiling and other lights by Messrs. Shrigley & Hunt, of Lancaster, and Mr. J. Davies, of the Wyle Cop, Shrewsbury; and the heating and the cooling apparatus by Messrs. Haden & Son, of Manchester and Trowbridge. The whole of the floors are of fire-proof construction, and have been executed by Messrs. Dennett & Ingle, of Whitehall, London. The locks have been supplied by Messrs. Charles Smith & Sons, of Birmingham, and the grates by Mr. James Roy, of Liverpool. When Mr. Lockwood received his instructions from the Shire-hall Committee, early in 1881, to prepare plans for the re-arrangement of the buildings, his attention was primarily directed to ascertaining how far the area of the old courts,—a total of 2,730 ft.,—would be adequate to provide the necessary accommodation in accordance with modern requirements. The conclusion at which he arrived was that the area would be altogether insufficient to provide anything like a satisfactory arrangement, being very much below the average of courts at Chester, Liverpool, Manchester, Durham, and Bristol. In the interest of the county, therefore, Mr. Lockwood recommended the adoption of a much larger space than the old court possessed, and this led to the suggestion of some new arrangements which provided adequate and separate means of access for the various persons having business there. The space devoted to each of the courts is 52 ft. by 36 ft., giving an area of 1,872 square feet to each, a size admitting of the use of the walls of the old building, and the provision of corridors for the most convenient access to the courts, and rooms in connexion therewith. The front entrance of the old building is intended for the judges, grand jury, barristers, and others in professional attendance at the Assizes, the new level of the courts being at the top of the first landing of the staircase, the doors on either side of which are for the barristers and solicitors. Beyond this is a further flight of eight steps to the main corridor on the level of the bench, from which access is gained to the grand-jury room, judges' retiring-rooms, and barristers' rooms. The corridors on each side, leading from the present side entrances in the front of the building, are intended for the public and those interested in the cases, there being doors placed so as to prevent mere idlers from gaining access to the body of the court, and so taking up the space intended for those engaged in the causes in progress. Convenient access is furnished to the cells, and therefrom to the docks in each court. The ground-floor accommodation comprises spacious and well-lighted entrance and waiting halls, rooms for the clerk of the Crown, and waiting-rooms for male and female witnesses. From these waiting-rooms witnesses obtain access to the courts in close proximity to the respective witness-boxes, — an arrangement which is adopted in the London Courts. The jury retiring-rooms, with their offices, &c., are on this floor. In the old portion of the buildings next the front, provision is made for the mayor's court, which is greater in area than before.

The dimensions of the new courts are as follow:—Length, 52 ft.; width, 36 ft.; height, 34 ft.; height of galleries, 7 ft. The effective ceiling light of each court contains eight panes of stained glass, each bearing a coat-of-arms.

The whole of the new buildings will, it is hoped, be ready for occupation in October next, while the work of completing the Nisi Prius Court will probably be accomplished in time to admit of the use of that court for the forthcoming autumn Assizes.

THE EXTERNAL USE OF PLASTER CASTS IN BUILDING.

A German technical journal remarks that the statute which enjoins a certain punishment for those who threaten the public safety by the careless execution of building work, will soon find an application in Berlin. It is asserted that the manner in which plaster consoles, rosettes, mouldings, &c., have been fixed in many new buildings (by wooden screws or other doubtful methods) is so insecure that numerous cases of their falling are to be looked for. Most of the houses referred to have been built within the last ten years, before which time it is said that more care and discernment were evinced in the use of plaster for the purposes indicated. The prohibition of its employment in this manner is suggested both from constructive and æsthetic grounds.

THE NEW REICHSTAG BUILDING AT BERLIN.

The execution of the above work is expected to occupy eight years. According to the *Deutsche Bauzeitung*, Herr Wallot has assumed the responsibility of his position as architect, and is to have the assistance of a responsible official in the technical and business portions of the work. This arrangement will, of course, only come into force when the details of the plan are finally arranged.

Herr Wallot's remuneration will be a fixed annual salary of 1,500*l*. He is also to receive a special premium at the completion of each important stage; the entire sum thus allotted being 6,000*l*. All the cost of his assistants, &c., is to be defrayed by the State.

SEPARATE OR SUB-CONTRACTS IN BUILDING MATTERS.

Sir,—The reference to this subject by a Clerk of Works, in your issue of the 28th ult., p. 130, seems to give room for some further remarks, and I venture, as one who has had opportunities of gaining experience in this and kindred subjects affecting building struction, to offer a few remarks in a disinterested spirit, and with a view to helping to arrive at a right understanding.

As to whether separate or sub-contractors' profits are generally in excess of what is reasonable, I need not enlarge upon now, nor would I venture to assert what should be the percentage allowed to the general contractor upon sub-contractors' works, since what may suit the circumstances of one case may not be properly applicable to others; 10 per cent. has been mentioned, and whether this would meet the average of cases, I would leave to other and more competent heads to decide.

It may be possible, however, here to discuss this vexed question in such a manner as to give a more intelligible view of the rights or wrongs involved than at present exists in the minds of many, and should these remarks have the effect of convincing architects generally that a fair case is made out] in favour of a more general recognition of the general contractor's claims in this vexed question, that it is right in principle to allow these claims, there should be little fear that architects being, as they are, mostly men of honour, would shirk from the duty of applying the remedy in common everyday practice.

It seems to be an impression in the minds of many thoughtful contractors that architects show a growing disposition to encroach unduly in this matter of separate or sub-contracts, and that by the introduction of sub-contractors into buildings, and over the heads, so to speak, of the general contractors, they are simply inserting the thin end of a wedge which would unseat the whole present system of general contracting, and ultimately split up the fabric into a series of separate contracts, with no one in particular responsible to the client for the integrity of the whole. However, this thread of the story need not be further pursued now; it may be assumed that there exists no wish on the part of general contractors to "break bones" over this subject of sub-contracts, but that there is a wish to have all such sub-contracts put upon such a footing as should ensure their being carried out subject to the general control of the general contractor, who has all the care and responsibility of the building on his hands; and it is urged that this object could be best effected by passing all sub-contracts through the general contractor's hands, to be paid by him, and that he should receive a fair percentage on the amount of such sub-contracts to reimburse him for interest on outlay, watching, protection, affording facilities, &c. The motives of architects for making these separate or sub-contracts may perhaps be not unfairly stated thus:—1. Not unfrequently has it occurred from want of confidence in the ability of the general contractor to perform such special works to satisfaction. 2. That something may be saved to the client which would otherwise go into the pocket of the general contractor. 3. That the specialist be brought into direct communication with the architect is an advantage to the special work to be executed. 4. That the architect only exercises a duty by securing for his client the very best appliances which skill and ingenuity can devise. 5. That the introduction of the separate or sub-contractor does not touch the general contractor any way to his hurt, since if he does not execute the work his loss is *nil*.

On the other hand, the general contractor argues his case thus,—That he is bound by the conditions of contract to uphold, maintain, and care for the integrity of the building in all its parts from first to last; that he is not allowed to sublet any part of his contract, though the architect does so; that he has to bear the expenses of general supervision, the proportion of office expenses, foremen, watchmen (day and night), hoardings, scaffolding for everybody, temporary barricading, casings for protection, fuel, gas, &c., and that this cost, in most instances, must come out of his ultimate profits, if any are made. That in addition there is a general unseen kind of waste constantly going on in a building, fully understood by those who come into day-to-day contact with the details of actual construction (the use of the word "waste" here is not intended to be understood in the sense of its being avoidable waste), the which is not lessened by the operations of sub-contractors' representatives during the process of fixing their works; that innumerable small expenses occur during the continuances of a contract which it is absolutely impossible to foresee or provide for; and finally that, under these circumstances, he is fully entitled to receive in all cases where separate or sub-contracts are entered into by the architect with other parties outside an adequate percentage on the amount of such sub-contracts in order that he may suffer no loss.

It has been said that all contractors have many sins of omission and commission to answer for of their own making and others' too; but however this may be, they can hardly be expected to cheerfully give the public twenty-one shillings' worth of labour and materials for a sovereign. This may seem to some class of minds the proper thing regarding contractors; but if it were to become more general a kind of Nemesis would be raised up, or, in other words, there would be in course of time but very few truly honourable contractors left. N.

A NEW WING TO MARLBOROUGH COLLEGE.

The large and handsome group of new buildings on the eastern side of the spacious quadrangle of Marlborough College, Wiltshire, is fast approaching completion, and in a few weeks will be opened. A brief description of the buildings, or at any rate that portion known as the musenm block, may perhaps interest our readers. The architect is Mr. A. W. Blomfield, M.A., in conjunction with Mr. A. E. Street, M.A. (the two architects who on the death of the late Mr. G. E. Street, R.A., were appointed by the Government architects of the Royal Courts of Justice), and the style of architecture is quite in keeping with the most important of the buildings of the college, which were designed by the celebrated Inigo Jones. Messrs. Stephens & Bastow, builders, of Bristol, secured the contract. Their original tender amounted to 8,750*l*., since considerably increased by an extra contract for arched cloisters at the north and south sides of the new buildings, and the work was commenced in May last year. When completed, these cloisters will make the block the most imposing structure of all the numerous college buildings. The arches of the cloisters are of rubbed and moulded red bricks, supported on Hopton Wood stone bases and columns, with Portland stone caps richly carved. The floors are polished Portland stones of large size. The roofs are flat, and covered with lead, and the ceilings are panelled in polished wood, with moulded red brick cornices. The new buildings are substantially constructed of red bricks. All the outer walls are two bricks and a half in thickness, and the inner walls are two bricks thick. The whole length of the quadrangle front is 108 ft.; height to the eaves of the museum, 36 ft.; and the block is surmounted by a flat, 30 ft. by 7 ft., surrounded by an oak balustrade at a height of about 50 ft. from the ground.

The Museum is a fine apartment, well proportioned and admirably adapted for the purpose for which it has been constructed. It measures 51 ft. long by 27 ft. wide, and 26 ft. high, with an open roof up to its purlins. The roof-timbers are of wrought pitch-pine, broken into panels, each principal divided into arched bays. A handsome gallery, of polished oak, panelled out, is around three sides of the room, and is approached by two circular staircases, also of polished oak. These staircases, as, indeed, all the oak fittings of the museum and other rooms, are good specimens of workmanship.

The works have been carried out under the supervision of Mr. H. Webb, as clerk of the works, with Mr. Stacey as manager for the builders. We understand Messrs. Stephens & Bastow are carrying out another large contract, under Mr. Blomfield, at the Charterhouse Schools, Godalming.

THE LONDON PAVILION, TICHBORNE STREET.

Extensive alterations are in progress to this building (which is the property of the Metropolitan Board of Works), under the superintendence of Mr. George Vulliamy, the Architect to the Board. The principal staircase will be rebuilt, and additional exits provided from the balcony, opening into Tichborne-street and the court in the rear of the premises. The hall will be enlarged by the addition of the shop, No. 4, Tichborne-street, and a portion of the Black Horse public-house adjoining. The cost of the works will be about 1,500*l*., exclusive of decoration. The builders are Messrs. J. M. Macey & Sons, who obtained the contract in a limited competition.

THE METROPOLITAN RAILWAY COMPANY'S SURPLUS LANDS.

EXPECTED INCREASE OF VALUE.

According to the statement of the Chairman of the Metropolitan Railway Company, there has been an enormous increase in the value of the company's surplus lands during the last few years. At a meeting which has just been held he stated that within the last twelve years, allowing for that which had been abolished owing to making new railways upon the sites of their property, practically speaking, the surplus estate had increased in annual value 52,000*l*. Now, 52,000*l*. represented over a million at 5 per cent., or over a million and a quarter at 4 per cent. How was it that the value of the surplus estate had increased in that manner? One phrase was sufficient to explain it. It was by keeping it, by waiting to enable it to ripen. Of course, he said, during the process of ripening somebody had to suffer. The ordinary stockholder was the man who suffered, and the man who sold his property ten or a dozen years ago sacrificed potential benefit, and the man who kept his property had got it. He should not then ask them what their course should be with regard to this surplus property, for they need not at present come to any determination, because the question was only beginning to arise whether it would not be policy to keep any surplus property that they had, even at some temporary sacrifice, in order that it might ripen at some future day. They had only to walk across the road [from the Three Nuns Hotel in Aldgate, where the meeting was being held], and they would see a magnificent piece of ground 33,000 square feet, in a very good position in London, which was producing nothing. Of course if they kept that some new purpose would arise, some new want would be created, and they would perhaps double or treble the price for the land compared with the price they should get if they were to-morrow to put it up to auction, and rush it too soon into the market.

UNHEALTHY CONDITION OF A BUILDING ESTATE IN CAMBERWELL.

The Camberwell Vestry have just had laid before them the shocking insanitary condition of a building site called the Newlands Estate, situated within the parish.

Mr. Middlemass inquired of the Surveyor how many houses there were in each road on this estate, and what proportion of land was uncovered; also the number of cesspools provided, and the number of houses not provided with them; likewise the estimated cost of a sewer for each road.

In reply, the Surveyor stated that in the Hall-road there were seventeen houses already built, about two-thirds of the land being uncovered. There were three cesspools for a block of seven houses, and there were ten houses without cesspools. In Stewart-street there were twenty-five houses built, and about two-thirds

of the land was uncovered. The total cost of providing drains and sewers in the roads would be 1,286*l.*

The statement of the Surveyor led to a prolonged discussion, in the course of which it was generally admitted that the condition of the estate was discreditable to the parish. The Sewers and Sanitary Committee recommended that sewers be forthwith constructed in the several roads named, but the Vestry Clerk gave it as his opinion that under the provisions of the Metropolis Management Act the roads in question could not be called "new streets," a sufficient number of houses to form "a new street" not having been erected, and that, therefore, it was not competent for the Vestry to construct sewers in the streets referred to, and charge the owners of the property with the cost.

Several members strongly urged the immediate construction of the sewers, notwithstanding the advice of the Vestry Clerk. Mr. Lewin said that if it was necessary to strain a point of law in the matter there was no case in which it could be strained with greater justice than in that of the Newlands. The condition of the estate was a disgrace, and on the grounds of public health he contended that the work ought to be done. Another speaker, Mr. Kemp, characterised the Newlands as one of the most disgracefully unhealthy places in the parish. The place, he said, was, under present circumstances, quite uninhabitable, and it was an act of absolute necessity that something should be immediately done to improve the sanitary condition of the estate, if the Vestry were not to incur the responsibility of an outbreak of cholera.

It was ultimately resolved that sewers be constructed in the roads, and that the cost be apportioned to and defrayed by the owners, but that before the sewers be constructed the owners be summoned.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,675. R. Martiney, New York, U.S.A. Mats or floor coverings. July 27, 1883.

3,685. W. A. Bonella, London. Fastenings for securing doors and gates. July 27, 1883.

3,701. J. Davies, Llannfyllen. Increasing the ventilation in chimneys, &c. July 28, 1883.

3,716. H. Pataky, Berlin. Roof covering. (Com. by C. Wildagen, Treseburg, Germany.) July 30, 1883.

3,718. B. D. Healey, Brighouse. Asphalte apparatus. July 30, 1883.

3,740. T. W. Helliwell, Brighouse, water-closets. July 31, 1883.

3,754. C. M. Tate, London. Apparatus for ventilating, heating, &c., the atmosphere of rooms, buildings, &c. July 31, 1883.

3,760. F. J. Austen, London. Automatic flushing and antiseptic tank. Aug. 1, 1883.

3,761. T. Griffith, Manchester. Stair-pads. Aug. 1, 1883.

3,775. T. W. Webber, Kellyville, Athy. Construction of roofs. Aug. 1, 1883.

3,788. A. J. Boult, London. Chimney-cowls. (Com. by J. Wüstner, Annecy, France.) Aug. 2, 1883.

NOTICE TO PROCEED

has been given by the following applicants on the dates named:—

July 31, 1883.

1,611. H. J. Haddan, London. Manufacture of tissues applicable as a base for plaster ceilings, &c. (Com. by H. Kahls, Saxony.) March 30, 1883.

1,694. J. B. Adams and J. Telford, Liverpool. Balancing, securing, &c., sliding window-sashes. April 4, 1883.

3,169. W. R. Lake, London. Matting, &c., for covering floors. (Com. by J. Bray, Washington, U.S.A.) June 26, 1883.

August 3, 1883.

1,585. W. P. Thompson, Liverpool. Heating apparatus for domestic use, &c. Com. by C. Launay, Paris. March 29, 1883.

1,592. L. C. Besant, Greenock. Stoves. March 29, 1883.

1,599. A. F. Andresen, London. Smoke-preventing and fuel-saving grates and stoves. March 29, 1883.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

2,535. F. H. F. Engel, Hamburg. Manufacture of artificial stone. (Com. by Y. E. Murjalen, Hamburg.) May 21, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending August 4, 1883.

5,704. H. J. Allison, London. Composition of matter or artificial stone for veneers, &c. (Com. by W. Matt and M. Mehrbach, New York, U.S.A.). Nov. 30, 1882. Price 2d.

This is made of a solution of glue, oil, and resin mixed while hot, with glycerine and paper pulp, and coloured as required. The mixture is then rolled into sheets and used as veneers, &c. (*Pro. Pro.*)

5,737. J. F. Farwig, London. Construction of stoves for burning paraffin and petroleum oils. Dec. 1, 1882. Price 2d.

Two concentric cylinders form the stove, and inside the inner one is the lamp. A coil of pipe is arranged above the lamp through which air passes to be heated. The products of combustion pass up the inner cylinder down the annular space between the two and then pass away at the bottom of the outer cylinder. (*Pro. Pro.*)

5,756. W. Foot, Wellington. Bricks, blocks, and slabs for building and paving purposes, &c. Dec. 2, 1882. Price 6d.

Dovetailed slots are formed in the sides and ends of the blocks, in which ties are inserted to bind them together.

5,760. J. H. Johnson, London. Bricks or blocks for building purposes. (Com. by J. Darrigan, Vaquotte, France.) Dec. 2, 1882. Price 6d.

These have double interlocking or compound dovetails formed on one of their sides, while on the others are corresponding projections.

5,772. R. W. Hitchins, London. Construction of fire and sound proof ceilings and floors. Dec. 4, 1882. Price 6d.

Wire netting is stretched beneath the joists, and a composition, formed of coke breeze and fibre mixed with alum, is poured in between the joists and made to cover the netting, beneath which it is moulded smooth by a temporary frame of wood.

5,778. J. D. Sprague, London. Window-sash fastenings. Dec. 5, 1882. Price 6d.

A semicircular piece of metal is pivoted between two cheeks on the lower sash in such a manner that it normally hangs with the circular part downwards. When the window is closed the outer edge of the semicircle automatically engages a hasp on the upper sash, and the window then cannot be opened from the outside. When it is required to open the window the inner edge of the semicircle is lifted and the outer edge is disengaged from the hasp.

5,781. G. Crofts and G. F. Assinder, Birmingham. Joints for suspending swing looking-glasses, fanlights, &c. Dec. 5, 1882. Price 6d.

The pivot-pin is secured in the standard and a plate secured in the frame of the glass turns upon a round part of this pivot. A circular disc is fixed upon a square part of the pivot inside the frame, against which press springs which can be tightened when required.

5,848. J. W. Butler, Blackheath. Indurating artificial stone. Dec. 7, 1882. Price 2d.

The material is subjected, in a closed chamber, to the action of the fumes of carbonic acid gas and vapours of sulphur combined with steam.

5,855. T. E. Parker, London. Open fire-grates, stoves, &c. Dec. 8, 1882. Price 2d.

This is an improvement on patent No. 3,156 of 1881, in making all the apertures and perforations of a conical shape. (*Pro. Pro.*)

6,027. J. Woodward, Wolverhampton. Latching bolts of locks and latches. Dec. 18, 1882. Price 6d.

This is an improvement on patent No. 717 of 1881, in making the extreme end of the bolt dome-shaped, and in combining therewith a short length of parallel-sided part so that the door cannot be opened by pressure alone.

Parcels Post.—Mr. J. C. Humphreys, of Knightsbridge, who built the corrugated iron buildings at the Fisheries Exhibition, has received an order from the contractor to the Parcels Post (Mr. James Allen) to erect within seven days stabling for sixty horses in Red Lion-yard, Clerkenwell. We understand the enormous strain upon the department has forced the authorities to increase the number of vans originally provided for, and hence the necessity of providing almost instant stable accommodation until permanent buildings can be erected. It certainly is an undertaking deserving of notice that a building 175 ft. long by 25 ft. wide can be erected and fitted complete with mangers, water-troughs, &c., in one week from date of order, and speaks well for the resources of Mr. Humphreys's establishment.

Art-Union of London.—The pictures selected by this year's prize-winners are now on view in the new galleries, 112, Strand. The private view is held on Monday next, the 13th. On the following days visitors will be admitted to the galleries on presentation of their address cards.

BATTEN'S MANHOLE COVERS FOR SEWERS.

We have on two or three occasions spoken favourably of the advantages of Batten's patent manhole covers and ventilators for sewers. Increased experience of their use confirms us in our good opinion of them. They are the invention of Mr. W. Batten, C.E., of Lozells-road, Birmingham, and have been largely used since their introduction a few years ago. The advantages claimed for them are thus summarised:—(1) That thorough ventilation of the sewers is secured; (2) that the refuse that may enter the ventilator is easily and quickly removed; (3) that free access is given to the sewers for flushing and other purposes; (4) that, as the entry of solid matter into the sewer is entirely prevented, the stoppage of the sewer is also prevented, and the dangerous results of the decomposition of such matter in the sewers rendered impossible; (5) the dirt-boxes are emptied by one man, with a small scraper, without removing the lid of the manhole-cover, or ventilator, which is only required when inspection of the sewer is necessary; (6) the upper portion of the dirt-boxes being seen from the footpaths, any one can tell whether the dirt-boxes are properly attended to or not; (7) the dirt-boxes being fixed, they require no repairs and cannot be lost or forgotten to be replaced; (8) in the old system of removable dirt-boxes, or catch-pans, two or three men are required merely to empty the *detritus*, and very often they have to hammer the castings, or lift the entire cover, or ventilator, from the brickwork before the lid can be lifted. The whole of this unnecessary labour is obviated by using the patent manhole covers and ventilators, thereby saving the cost of the extra men's time.

NATIONAL ASSOCIATION OF MASTER BUILDERS.

On the 30th ult. the half-yearly meeting of the National Association of Master Builders of Great Britain was held in the Waterloo Hotel, Edinburgh, when representatives from London, Liverpool, Bristol, Birmingham, Leeds, Bradford, Glasgow, Hull, Walsall, Lancaster, Dalkeith, Dundee, St. Helen's, Wigan, Newport, St. Andrews, and Crewe attended.

The Association was formed in 1878 for the purpose of defending the interests of its members against combinations of workmen seeking, by strikes and other means, to impose restrictive conditions upon building trades; to secure united action and mutual support in dealing with demands made by such combinations, especially in reference to hours of labour, piecework, and similar points; and for other objects connected with trade interests. The Association holds its half-yearly meeting in the principal cities of the country in turn, and this is the first time it has been held in Scotland.

The chair was occupied by the president, Mr. Stanley G. Bird, London.

Mr. W. Knox, Liverpool, secretary, read the half-yearly report.

The Chairman moved the adoption of the report, and in doing so he explained the action that had been taken by the sub-committee on quantities. He stated that some time ago a meeting was held at Birmingham, at which the whole matter as to quantities, forms of tender, and conditions of contract were fully discussed. It was left to him to try and bring about a meeting with the Royal Institute of British Architects. He explained that the question of quantities and contracts was the one point of importance to master builders at present. It was the one thing which builders suffered from more than any other, and was the means of great loss to them. Referring to the bills which had been introduced in Parliament affecting the building trades, he said they cordially supported that which had been passed to prevent the payment of working-men in public-houses. They could not, however, give the same support to the amendments proposed on the Employers' Liability Act. It had been alleged that under the present Act people had contracted themselves out of it; but he could say, without fear of contradiction, that not a single builder in England or Scotland had attempted to do that. What they objected to principally in the proposed amendment of the Act was the attempt to do away with the six

weeks' notice of an action at law in the case of a workman meeting with an accident. They considered this proposal was a very unjust one to them, and he was glad they had been successful in getting the Bill thrown out by a large majority.

Mr. J. H. Mackay, Dundee, seconded the motion, which was agreed to.

It was resolved that the resignation of Mr. E. Hughes, treasurer, be accepted, and that Mr. White, Liverpool, be elected to fill the office of treasurer.

The next meeting was then fixed to take place in Bradford, in the last week of January next.

The members were entertained by the Master Builders and Master Painters of Edinburgh at a banquet in the evening.

THE CHRONICLER, RICHARD OF CIRENCESTER.

This is a name of very doubtful omen. The writer, at p. 143 of the *Builder*, gives no references, but I fear that his quotations are taken from the fraudulent compilation imposed by Charles Julius Bertram, on the credulity of poor Dr. Stukeley, and first published by him in 1757.

Not knowing how far a recapitulation of the evidence is now called for, I forbear entering on the full details, and merely make this protest, stating that the name of Richard of Cirencester, a monk of Westminster, who lived *circa* 1350-1402, has been most unwarrantably used by a forger, as skilful in his way as Chatterton, Ireland, Psalmanazar, or Simonides. I need not mention living adepts, for unfortunately the law of libel fosters these criminals for a time.

Bertram's forgeries, accepted for about a century, have become welded into our histories, our maps, and gazetteers. The confusion is endless, and the results are often adopted, most innocently, by scholars who utterly reject the original.

A. Hall.

HOW SURVEYORS DIFFER.

Sir,—Some time ago an advertisement appeared in your columns inviting tenders from surveyors for the survey of the Local Board District of Brighouse in Yorkshire, comprising some 400 acres.

It may interest some of your readers to know that the tenders ranged from 96*l.* to 980*l.*, but the Clerk to the Board considers "it would be a breach of confidence to state the amount of tender accepted." A novel idea, certainly. I may say that the survey is to be planned to a scale of 30 ft. to an inch, and the other conditions are most stringent.

A.M.I.C.E.

WATER COMPANIES' CHARGES.

DOBBS *v.* THE GRAND JUNCTION WATERWORKS COMPANY.

In this case (which came before the House of Lords on appeal last week) a question of considerable practical importance arose. The company is authorised by the Act 15 & 16 Vict., c. 157, to levy water-rates on dwelling-houses according to their "annual value." The plaintiff occupied a house in Westbourne Park, and the company made an assessment on him at the "gross rent," without making the deductions for tenant's repairs, insurance, tenant's rates, &c., which are usually made in order to reach the net value on which the poor-rate is assessed. Mr. Dobbs insisted that the true basis of rating was the net value alone. The metropolitan police magistrate, before whom Mr. Dobbs was summoned, held that he was liable on the gross value, but stated a case for the opinion of the Queen's Bench Division. The Queen's Bench Division, consisting of Justices Field and Bowen, reversed the decision of the magistrate, holding that Mr. Dobbs was liable on the net value only. The Court of Appeal (Lord Coleridge and Lords Justices Baggallay and Lindley) reversed the decision of the Queen's Bench Division, and held that the assessment should be made on the gross value. An appeal from their decision came before the House of Lords, and was argued at considerable length, last week.

The Lord Chancellor (with him were Lords Blackburn, Bramwell, Watson, and Fitz-Gerald) intimated on Tuesday last that he desired, for public convenience, to announce that their Lordships were unanimously of opinion that the decision of the Court of Appeal should be reversed, and that of the Queen's Bench Division restored, for reasons to be given at large at their next sitting.

PROVINCIAL NEWS.

Ramsgate.—A new amphitheatre, erected for Mr. George Sanger, has just been opened here. It forms part of a large block of buildings, with frontages to High-street and George-street of 127 ft. and 117 ft. respectively. The principal entrance to the amphitheatre is by a wide corridor through a lofty tower in High-street. Other entrances are in George-street. All staircases are of stone, and the exits are of such capacity that the audience (numbering 2,000) can, it is claimed, be easily cleared in a minute and a half. The area of the auditorium is 5,000 ft., its height from floor to ceiling 50 ft. The stage is 2,000 ft. in area. On each tier lavatories and other conveniences for the comfort of the audience are provided. The building is designed to meet varied requirements, and can be used as a theatre or circus, and by lifting the floor of the stalls, and a portion of the pit, the building is intended to be available for a dancing and assembly room, or for promenade concerts, &c., with a floor over the entire area level with the stage. The building is erected in a substantial manner, the walls being of brick, the roof of iron covered with slates, and iron girders have been introduced into the floors as required. The gas supply to the different parts of the building is by separate services. In addition to this amphitheatre, the block of buildings consists of five shops and a restaurant, with lofty frontages of red brick and Ancaster stone. The style adopted is Italian Renaissance of ornate character. The total cost is about 30,000*l.* The architect is Mr. Albert Latham, C.E., Borough Surveyor of Margate; and the builders are Messrs. Denne Bros., of Upper Walmer, their foremen being Messrs. Parsons, Weymouth, Knight, & Pepper.

Dudley.—The foundation-stone of the new Free Library and School of Art was laid on the 7th ult., by Earl Beauchamp. The site of the new block of buildings is at the corner of Priory-street and St. James's-road. The reading-room and library, both 50 ft. long, are on the ground floor, and approached by lobby-entrance from Priory-street. At the rear of the building, approached from St. James's-road, is placed the Art Gallery, 40 ft. long by 27 ft. wide, lighted on one side by skylights, and on the other side by windows near to the ceiling. The whole of the upper floor is occupied by the School of Art. The elementary room is towards Priory-street, 48 ft. long and 27 ft, wide, and lighted from the roof by large lantern light. The antique room is over the Art Gallery. The painting, modelling, and masters' rooms are all arranged in conformity with the regulations of the South Kensington Art Department. Committee-room, caretaker's rooms, store-rooms, and lavatories are also provided. The whole of the building is well ventilated, and will be warmed by hot-water pipes. The exterior of the building will be of plain Renaissance character, of red terra-cotta and brickwork, and the roofs covered with green Westmoreland slates. At the corner of the two streets will be an oriel, terminated with a lofty turret. The works are being carried out by Messrs. Webb & Round, builders, of Dudley, under the joint superintendence of Mr. J. J. Bateman and Mr. B. Corser, architects, both of Birmingham, whose plans were selected in a limited competition. The cost of the buildings will be about 5,000*l.*

CHURCH-BUILDING NEWS.

Steynton.—Steynton Church, Pembrokeshire (the parish church of Milford) was re-opened by the Bishop of St. David's on the 18th ult. after a complete restoration by Mr. Henry Edwards, of Milford, from the plans and under the superintendence of Mr. E. H. Lingen-Barker, architect, of Hereford. The fabric consists of tower, nave, chancel with hagioscope, north and south aisles, and north porch; and no change in the outline of the building has been made, though the chancel and aisles are of comparatively modern date, the remainder being fourteenth-century work, all five of the original two-light nave windows having been found walled up in different parts of the building, and, of course, re-opened and reglazed. The belfry lights have also been carefully restored and re-louvred, and the sanctus-bell cot rebuilt upon the old lines. The east and west galleries, the old pews, and other flimsy fittings, have been removed, the upper tower arch and hagioscope opened. New open-timbered roofs, covered with silver-grey slates to the original pitch, have been built, the thin walls of the aisles being strengthened to receive the heavier timbers by internal piers, so as to preserve the external unbuttressed characteristic of the churches belonging to this district. New pitch-pine doors, open seats, and other fittings have been provided throughout, the only exception being that of the pulpit, which is of carved stone supported on marble shafts. Mr. Ben. Gay, of Bristol, supplied the ornamental cathedral glazing; Messrs. Brawn, of Birmingham, the wrought-iron work; Messrs. Webb, of Worcester, the encaustic tile pavement; and the carving has been executed by Mr. Herridge, of Cardiff. Two curious discoveries were made during the progress of the works, in the one case (as we have already mentioned), four human thigh-bones were found hidden in long narrow recesses above the piers of the nave arcade; and in the other case a perfect human skeleton, with three horses' skulls and a pipe-head, were taken from below the chancel-step. Fenton, in his "History of Pembrokeshire," alludes to the tower of this church, from its elevated position and command of the country, as having been garrisoned with twenty musketeers and some horse collected about it to cut off communication between Pill Fort and Haverfordwest. It is therefore supposed that this strange burial took place at that time. The accommodation has been raised from 273 to 383, and the total outlay has been about 1,500*l.*

Bacup.—The new Church of St. John the Evangelist, lately consecrated, replaces a dilapidated structure, which for some years had to be propped up to prevent its untimely collapse. The new church is massively built of stone. The peculiarities of the design, if such there be, arise mainly from the nature of the site, which is irregular in form, confined in size, and is, moreover, steeply sloping. The church accommodates between 800 and 900 adults, and consists of a nave, chancel, north and south nave aisles, north chancel aisle, and a western narthex and baptistery. The tower, a portion only of which is at present built, is placed at the highest part of the site, on the south-west corner of the building, and, when finished, will be a conspicuous object from all parts of the town. The nave floor-line, following ancient precedents on similar sites, slopes down towards the chancel step. The nave, chancel, and narthex are of the same width, forming a parallelogram about 120 ft. in length and 27 ft. broad, and giving a lengthened perspective effect as seen from the baptistery, which is projected in a westerly direction from the narthex. The chief entrances to the building are through the tower and north-west porches. They are both in sheltered positions, and open into the narthex, which, except on crowded occasions, will remain an open, unseated space. The walls internally are almost entirely faced with dressed ashlar. The roofs, which are open-timbered, are throughout boarded and felted. The nave is about 67 ft. long, and is divided from the aisles by arcades of four bays. The nave walls are thus carried upon six pillars, which are circular in form, with well-moulded capitals, bases, and annulets. These capitals alternate in design, and the bases vary in height, following the slope of the floor. The nave is about 55 ft. high from floor to ridge of roof, and about 33 ft. to the wall-plate. The chancel arch is carried on massive quatrefoil pillars, which range with and are a development of those of the nave arcade. Indeed, this arcade is in reality carried on into and through the north and south walls of the chancel, leading the eye on, in perspective, from end to end of the building. Across the westerly end of the nave this arching is repeated, and thus there is a continuous arcade of fourteen arches running round the nave and chancel. The chancel is about 38 ft. long, and (as already stated) 27 ft. wide, thus allowing space for a good-sized choir. It opens on the north side by a wide arch into the organ-chamber. The choir seats and other fittings are solid and good, and have been executed by Mr. W. A. Peters, of Rochdale. The pulpit is of stone, circular in shape, and projecting (ambone fashion) from the low wall under the chancel arch. There are marble pillars in its open arcade, and a

carved cornice. The floors of the chancel are paved with Godwin's encaustic tiles. The oaken Communion-table and altar-rail, sedilia, surplice stand, and vestry cupboard have been executed by Mr. Thomas Scott, joiner, of Manchester. The gas-fittings in the chancel, and those throughout the church, also the brass standards of the altar-rail, are the work of Messrs. T. T. Freeman & Co., of Manchester. The baptistery is semi-hexagonal in plan, with an hexagonal roof. The font, — executed by Messrs. Earp & Hobbs, — is of coloured alabaster, with marble pillars. The heating of the church is by hot-water pipes, and is being done by Messrs. George Petrie, of the Phœnix Foundry, Rochdale. The sittings in the nave and aisles are low, open benches. The contractors for the masonry are Messrs. James Hargreaves & Co. The woodwork (with the exceptions named) is done by Mr. J. Plane; and the slating, by Mr. J. Rushton. The architects are Messrs. Medland & Henry Taylor, of Manchester.

Fulham.—The Bishop of London last week consecrated the new church of St. Peter, on the Salisbury Estate, Fulham. At the special request of the Bishop a mission was commenced about two years ago to meet the spiritual needs of this rapidly increasing suburb. A site was secured, and a school church erected, in which services have been conducted by the Rev. Rowland Cardwell. The new church has been erected by Messrs. Gibbs & Flew, from designs by Mr. Arthur Billing, and will accommodate 750 adults. The cost of the edifice is about 5,550*l.*; 1,000*l.* is yet required for the completion of the spire, and 500*l.* for the organ.

Eyam.—The re-opening services in connexion with the restoration of St. Helen's Church, Eyam, Derbyshire, took place on Tuesday last. The works, which include a new south aisle, have been carried out under the direction of Mr. J. D. Webster, architect, of Sheffield. In 1868, the restoration of the north aisle and chancel was begun by the late Mr. G. E. Street, R.A., and completed in 1870.

STAINED GLASS.

Cullingworth (Yorkshire).—Two stained-glass windows have been erected in the chancel of this church, of which the figure subjects respectively are St. Peter and St. John. The figures of these apostles, each painted upon a white screen background, stand boldly forth beneath rich canopies, upon ornamented bases, and with suitably enriched brochures. They are a gift by Mr. E. H. Hartley, as memorials of his deceased sister, Nancy, and father, John, Hartley, of Bent's House. Messrs. Powell, Bros., of Leeds, are the artists.

Andover.—The parish church has been further enriched by the addition of a two-light window, from the studio of Mr. Charles Evans, of Warwick-street, Regent-street. The window is very rich in colour, and the figures are arranged to harmonise with a very elaborate subject of "Christ in Majesty," painted on the wall beneath. The window is erected to the memory of Mr. Gradedge.

Books.

Mechanical Drawing: Self-taught. By Joshua Rose, M.A. London: Sampson Low, Son, & Marston.

Many years ago the writer of this notice, having "inked in" a drawing, was about to rub out all the pencilling, when he was stopped by his employers. "Hold, Sir! Why rub out those *constructional lines?* They helped you to draw that and they will help others to follow your meaning." The American author of the above book has left in his woodcuts *his* constructional lines advisedly, and they do show the methods by which he has set out and the centres from which he has struck his curves, the cogs for his wheels, and gearing, &c. They furnish much of the instruction which is usually given orally, and carry out, to some extent, his object of placing something in the hands of students by the aid of which they may teach themselves mechanical drawing.

The subject is taken up in its most elementary form, and nothing is omitted which the learner should be told. The least satisfactory chapter is that on the difficult art of shading and colouring, and on this point personal instruction is, perhaps, indispensable. The woodcuts,—apparently taken from photographs,—are poor and coarse; the shadows opaque, and by no means such as the tyro should copy; and it is a pity that an otherwise useful book should fail in a particular in which the Americans have lately shown themselves such adepts.

The Open Fireplace. By J. Pickering Putnam. Boston: Osgood & Co. London: Trubner & Co.

The author of the above has laid under contribution American, French, and English publications, from which and from the *Builder* he has freely borrowed hints and illustrations of fireplaces of all ages and countries. Such a collection brought between one pair of covers cannot fail to be interesting. In many instances, however, the drawings have been so much reduced as to have lost all their characteristic detail, and the wood-cutting throughout is indifferent.

The writer is a strong advocate of the open fireplace as against stoves and hot-air apparatus of all sorts: his object is to show how the radiant heat may be made the most of, and as a consequence how fuel may be best economised. We need not say for how many years we have laboured in the same field, or how entirely our sympathies are with the writer in his endeavour. The chapter on the ideal fireplace sets out anew the *desiderata*, and repeats the old indictment against the present wasteful construction. The several attempts which have from time to time been made to utilise waste heat are all based on the same principle, and seek, by the introduction of air behind the grate, and by warming it in contact with fireclay or iron chambers, and gills or plates, to impart a certain degree of heat to it, and then to discharge it into the room, either at the head or sides of the grate, or above the mantel, or, as in the Galton grate, near the ceiling.

The author speaks with approbation of the "Peclet" grate, which exposes the chimney-flue in a sort of niche above the mantel, and so imparts to the air in the room the heat which usually goes to warm the chimney-breast.

We cannot say that the writer has done very much to advance the subject, but he has brought into a focus much scattered information about it, and a multitude of examples ancient and modern. Notwithstanding an Englishman's love for his "hearth," it is evident that the French architects of the Renaissance were far ahead of us in the boldness, originality, and delicacy with which they treated this feature of domestic architecture.

Irrigation and Water Supply. By John Scott. London: Crosby Lockwood & Co.

We had occasion lately to notice with appoval a companion treatise on draining and embanking lands by this author. The present work deals with the reverse process of increasing the fertility of lands by irrigation works in times of drought. The author states that English water-meadows are doubled in value by this means, and that a good supply of water has been known to increase the value of arable land from four to ten-fold. Professor Johnson has a remarkable passage to the effect that the great deserts of the world are not sterile because they cannot yield the soil-food required by vegetation, but because they are destitute of water. In these days, when the farmers have hard work to make their occupation yield a living, such a book as this should need no apology. The subjects embraced by it are a little wider and more various than the title would lead one to expect, and the construction of wells, obtaining water by artificial means, its storage, purification, raising, and distribution are taken up successively and treated with competent knowledge and with business-like clearness and brevity. Plans are freely given in illustration of suitable treatment of lands of varying figure and contour, with descriptions of the several systems of irrigation respectively applicable to each.

Not the least valuable portion of the treatise is that devoted to the statistics of outlay and return furnished by the experience of well-known sewage farms such as that at Croydon, and the relative values of the produce as against farms under the ordinary treatment.

The chapter on wells brings out the fact that the Americans have the "biggest thing" in wells at St. Louis, it having a depth of 3,850 ft.

The chapter on domestic water-supply only deals in a partial manner with a large subject. Indeed, too much is attempted in this little book, which embraces some subjects which should have formed separate treatises. So far as it goes it is excellent.

VARIORUM.

"Hydraulic Manual," by Louis D'A. Jackson (Crosby Lockwood & Co., London). This book is like the instrument-maker in "Dombey & Son" "chock full of science," and its pages, consisting as they do of long strings of formulæ of learned complexity, are enough to scare the non-scientific and non-mathematical reader. The author is quite given over to the subject of the flow and discharge of water under every conceivable condition of conduit and orifice, and follows the intricacies of the subject with never-flagging zest. His work has reached a fourth edition, which may be taken as a test of its value to those whom it concerns. The most generally useful portion of it we venture to say will be the numerous tables of velocity and discharge which can be profitably consulted by the ignorant many while the rest of the work is only addressed to the learned few. The chapters on the "control of floods," on "field drainage," the ruin of "canals," and that on "water meters" have an interest for every one.——"The Land of the Five Rivers and Sindh," by David Ross, C.I.E. (Chapman & Hall, London), is the title of a collection of sketches historical and descriptive of a country the interest of which neither sketch nor description can exhaust. Although "the land of the five rivers" has been the scene of the principal events in the history of India from the earliest period up to the time of it annexation to the British territory, the history will not perhaps be so universally interesting as the description which deals with scenes of beauty and grandeur almost beyond belief. Everything is on the same immense scale,—cities, palaces, temples,—ruined centuries since and deserted, or overwhelmed by some catastrophe which buried all in one confused and hideous doom. The remains of sculpture and the ornamental forms of articles of domestic use buried for a thousand years show to what a degree of excellence the arts had then attained, and make us regret that the book is not furnished with adequate illustrations.——"Smoky Chimneys, their Cause, Prevention, and Cures," by Captain J. T. Johnston, R.E. (Bowering & Co., Plymouth). We cannot say much in recommendation of this pamphlet, and will not therefore discuss it at length, only remarking that amongst the "natural facts" upon which the author bases his theory "No. 3, smoke is heavier than air until it becomes rarefied" is ambiguous; and "No. 4, dry air is heavier than moist air" is misleading. The old criticism (attributed to Dr. Johnson) about the new things and the true things might be applied not inaptly to these "notes."——"Practical Upholstery," by a Working Upholsterer (Wyman & Sons, London). This book is evidently all that it pretends to be. In what sense we are to understand the words "A Working Upholsterer" is a little doubtful; the preface says he is a "gentleman of exceptionally large experience." Whoever he may be the book is well written, clear, and comprehensive, and eminently practical. The designs,—which are plentiful,—are many of them elegant and appropriate, and avoid the faults and vulgarities incident to too much of what goes under the name of upholstery. The book will not only be of use to "the trade," but to those housewives who economise by effecting, for a small outlay, what is often unnecessarily performed by other more expensive means, and it should therefore have a wide sale.

Miscellanea.

Ventilation of Public Buildings.—Messrs. Robert Boyle & Son, 64, Holborn Viaduct, and Glasgow, have had their system of ventilation adopted for the following public buildings:—New Art Galleries, Liverpool; New Art Gallery, Birmingham; Guildhall, Bristol; New Public Hall, Cardiff; General Post Office, Manchester; New Theatre and Concert Hall, Devonshire Park, Eastbourne; Boys' Home, Forest Hill; Children's Hospital, Brighton; New Workhouses, Wandsworth. They are also at present ventilating for Mr. Arthur W. Blomfield, St. Michael's Church, Paddington; St. John's Church, St. Leonard's; and Emmanuel College Chapel, Cambridge.

Congregational Church, Richmond (Yorks.).—On the 11th ult. the foundation-stone of a new Congregational church and schools, intended to supersede those which have been in use for the past forty or fifty years, was laid. The plans, by Messrs. Clark & Moscrop, architects, of Darlington, show a church with chancel, accommodating 320 persons, schools and class-rooms behind for 110 scholars, and the usual vestries and ante-rooms. The building will be in the Early Perpendicular style of architecture. An octagonal tower, with long traceried belfry windows and lofty spire, will be placed at the south-west corner. The walls are to be faced with limestone blockers, with freestone dressings, and the windows glazed with rolled cathedral glass. Ample arrangements will be made for ventilation and heating by hot water. The total cost is estimated at 1,600*l.*, the contractors being:—Mason work, Mr. Wm. Shaw, Richmond; joiner work, Mr. H. Harwood, Manfield; slating, Mr. T. Wandless, Darlington; smith's work, Messrs. R. Spence & Co.; plumbing, Mr. C. Fryer, Richmond. The ceremony was performed by Mr. E. Crossley, J.P., of Halifax.

Memorial to the late Lord Frederick Cavendish.—The design adopted by the committee for erecting the proposed monument to Lord Frederick Cavendish, on the South Nab, an eminence situated to the east of Bolton Abbey, is a massive square embattled tower, of Gothic character, affording a wide prospect of the surrounding hills and woods, the Valley of Desolation, the abbey ruins, and river Wharfe. The monument stands on a rocky base, composed of the stone of which the hill is formed, so as to make it appear as natural an outgrowth from the hill-side as possible; and it is approached by broad flights of stone steps, with a terrace and parapet at the base of the tower. The materials of which it is intended to construct the memorial tower will be obtained in the district as far as practicable. The design selected was submitted by Mr. Thos. Worthington, architect (of the firm of Messrs. Worthington & Elgood, architects, Manchester), under whose joint superintendence the work will be carried into execution.

London and Middlesex Archæological Society.—The annual excursion of this society was to Edgware, Whitchurch, Stanmore, &c., on the 7th inst. The Chandos Chapel at Whitchurch, with its decorative paintings by Laquerre and Verrio, were much admired, as well as the general appearance of the interior, which was explained by the Rector, the Rev. J. B. Norman. Great Stanmore, with its ancient church of brick in part remaining, was also visited and described by the Rev. F. C. Jackson. The new church of Great Stanmore, close adjoining, was built some years ago, after the designs of Mr. H. Clutton. A short account of the Manor of Edgware was given by Mr. S. W. Kershaw, F.S.A. (the hon. secretary), and Professor Hales and Mr. E. W. Brabrook, F.S.A., commented on the ancient earthwork of Grimes-Dyke, near Pinner. About 100 persons, members and visitors, were present, and the meeting was one of the most successful and numerously attended for some years past.

Borough of Oswestry. — At a special meeting of the Town Council held on Thursday, the 2nd inst., it was decided to make an application to the Local Government Board for sanction to borrow a sum of money for ventilating and flushing the whole of the town sewers, according to plans prepared by the Borough Surveyor, who was complimented highly upon the system proposed and the plans he had prepared; it was also decided to advertise for tenders for diverting the effluent sewage waters and constructing new drainage works at Crumpwell. Plans for the works have been prepared by Mr. H. T. Wakelam, C.E., the Borough Surveyor.

The Wandsworth-roads. — The Wandsworth Board of Works on Wednesday agreed to purchase for 2,000*l.*, from Price's Candle Company, a piece of land, for the purpose of widening the public footpath at York-road, Battersea. In addition to the sum named the Board will erect for the company a new boundary-wall, at an estimated cost of 200*l.*

Nuneaton Surveyorship. — The Local Board of Health at their last meeting unanimously elected Mr. Charles Law Green, C.E., late of the City Surveyor and Waterworks Engineer's office, Coventry, to fill the above office. There were seventy-three applicants for this appointment.

Suggested Alterations in the House of Lords.—On the 1st inst., a Parliamentary paper was issued containing the report of the Select Committee of the House of Lords appointed "to consider the construction and accommodation of the House, including the galleries and rooms belonging thereto, more especially in reference to seating, hearing, and reporting; and whether any and what improvement therein can be made." The report recommends that a larger room be given to the reporters for the purpose of transcribing their notes, and suggests certain alterations in the reporters' gallery, the effect of which would be to give a slightly-increased amount of accommodation. With regard to the accommodation for peers the fifth paragraph of the report says,—

"The seats in the side galleries are extremely narrow and uncomfortable, and on the nights when there is a large attendance the amount of accommodation is much short of what is needed. The committee think that an extension of the side galleries, giving 226 comfortable seats in place of 146 seats, many of which are cramped and uncomfortable, would be desirable, provided it can be done without injury to the architectural beauty of the House, and the wider galleries would probably improve the acoustic qualities of the House. In order to judge of the effect which a widening of the galleries would have on the appearance of the House, the committee recommend that the experiment should be tried by projecting (but not for occupation) the whole or a sufficient part of one of the galleries, taking care that the new work shall be made and coloured or toned so as exactly to correspond in colour, material, and shade with the present work."

Other minor alterations as to gangways, lavatories, cloak-room accommodation, &c., are suggested.

A Dirty Slaughter-house at Coventry.—Mr. John Young Butcher, of 40, Smithford-street, has been again before the Coventry City Police Court, on August 1st, and fined 2*l.* and costs for not having proper receptacles, with tight and close-fitting covers thereto, for receiving and conveying away all the manure and offal from his slaughter-house. Mr. Walter Browett appeared on behalf of the Sanitary Committee to prosecute, and stated that the defendant had been before the Court only recently, viz., on June 21st, and was then fined 1*l.* and costs; but that warning did not seem to have had the desired effect. He therefore now asked the bench to increase the penalty to such an extent as would save him the trouble of repeatedly summoning the defendant. Mr. Frederick Brooker, the Sanitary Inspector, in his evidence, stated that on July 24th he visited the defendant's premises, and called his attention to the filthy condition of his slaughter-house, to the absence of those proper receptacles that were required by the by-laws, and in answer to the inspector the defendant stated that he did all he could to see that the "stuff" was got away. He had been trying to get some tubs, but found that they would cost too much.

St. Ann's, Sheffield. — The colour decoration of this newly-consecrated church is at present confined to the chancel; the most prominent and interesting feature of such decoration being the conversion and utilisation of an antique stone reredos which for very many years held that status in the old parish church proper of Sheffield. By reason of wear and time the stone of this fabric had become unfitted for any further exercise of the carver's art, though still available for that of the skilled artist-painter. As now treated, all the elaborate details of the old ornamental carvings have been not only preserved, but picked out and emphasised in rich colours and gold. The reredos is in three sections; the middle containing three panels, and the wing sections two panels each. In the central panel the Last Supper has been artistically painted. Messrs. Powell Bros., of Leeds, are the artists, Mr. J. D. Webster, of Sheffield, being the supervising architect.

New Hospital at Greenwich: Circular Wards.—On the 1st inst. the Earl of Dartmouth laid the foundation-stone of a new hospital, in connexion with the Royal Kent Dispensary at Greenwich. The hospital will at present consist of only one ward, which will be styled the "Miller Memorial Ward." It is to be erected on a new plan, with circular wards, and will be the first hospital in this country which has adopted the system of circular wards. The hospital is intended to perpetuate the memory of the Rev. Canon Miller, D.D., vicar of Greenwich, 1866—1880, founder of Hospital Sunday.

The Cork Exhibition.—In connexion with this Exhibition we may mention that the premium of 5*l.* offered for the best design for the Prize Medal,—the competition being open to all Ireland,—has been awarded by the Executive Committee to Mr. Richard Q. Lane, of Belfast. The design for the medal is in the Celtic style, and is $2\frac{3}{4}$ in. in diameter. On the obverse is a foliated trefoil, in the centre of which is placed the City of Cork shield of arms. The space above and on each side of the shield is filled in with intricate scroll tracery, characteristic of the style, while the spandrels between the trefoil and circular band running round it are filled with interlaced work. The inscription (and date) is placed on the circular band already referred to,—"The City of Cork Industrial Exhibition. MDCCCLXXXIII." On the reverse, in a circular panel, is placed an ancient Irish harp, with scroll ribbon thrown across and partly entwined, bearing the words "Awarded to." Surrounding this is a band, left blank for exhibitor's name, &c., while outside all is a space divided into panels by circular and square bosses alternately, three of each, ornamented in character with the style, the six panels being filled with strap fret-work to correspond, treated in three different ways.

TENDERS.

For re-building a warehouse at Bell's Wharf, Millbank, for Messrs. J. & G. Bell. Mr. John S. Woodard, architect:—

Hall & Bedall	£1,120 0 0
Hayward Bros.	1,100 0 0
Colls & Sons	1,059 0 0
J. & J. Greenwood	1,050 0 0
Bywaters	1,020 0 0
Barrie Bros. (accepted)	953 0 0

For alterations, additions, and repairs to Hope Cottage, Church-road, Upper Norwood, for Dr. Hetley. Mr. Frederic W. Ledger, 3, Lombard-court, architect:—

Garratt	£507 0 0
J. Smith & Sons	475 0 0
J. & C. Bowyer	397 0 0
Jenkin (accepted)	342 14 0

For extension of business premises, No. 70, Western-road, Brighton, for Mr. W. Hetherington. Mr. Frederic W. Ledger, architect:—

T. Mills	£438 10 0
W. & T. Garratt (accepted)	384 0 0

For Stoodleigh Court, Devon. Messrs. Ernest, George, & Peto, architects. Quantities supplied:—

Simpson & Co.	£14,601 0 0!
Manley	14,533 0 0
C. Trask	14,520 0 0
Lettebridge	14,222 0 0
Stephens & Bastow, London and Bristol	12,725 0 0
Cowlin & Sons, Bristol	12,198 0 0
Estcourt, Gloucester	12,119 0 0
Peto Bros.	11,461 0 0
Luscomb & Son	10,619 0 0
W. Pethick	9,281 0 0!

For the erection of ambulance station, porter's lodge, and other works, at the Western District Hospital, Fulham, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, 15, Leadenhall-street, architects. Quantities supplied by Mr. C. Poland:—

J. H. Brass	£10,150 0 0
Thorn	10,150 0 0
Holland & Hannen	10,035 0 0
Gibbs & Flew (Lim.)	10,000 0 0
C. Wall	9,902 0 0
Dove Bros.	9,895 0 0
Wall Bros.	9,777 0 0
Mowlem & Co., Millbank (accepted)	9,730 0 0

For decorations, &c., to Palace Gardens Church, The Mall, Kensington. Mr. Alexander Payne, architect:—

Heaton, Butler, & Bayne	£565 0 0
Kerr & Bright	487 0 0
Wilkinson & Son	462 0 0
Decorative Co-operators' Association	405 5 0
Gregory & Co.	376 15 0
Hampton & Sons	329 15 0
Dobie & Son (accepted)	315 0 0

For a cottage home, Old Charlton, Kent, for Sir Spencer Maryon M. Wilson, bart. Mr. John Rowland, of Charlton, architect. Quantities supplied:—

William & Son	£1,763 0 0
Hayward & Son	1,760 0 0
W. Tansett	1,678 0 0
Patman & Fotheringham	1,595 0 0
Kirk & Randall	1,555 0 0

For additions, Sunnycote, Hampstead-hill Gardens, for Mr. H. B. Lee. Messrs. Batterbury & Huxley, architects:—

Holliday & Greenwood, Loughborough Junction (accepted).

For new gas-tank, &c., at Ilford. Mr. Jabez Church, engineer:—

W. Webster	£3,233 0 0
Aird & Sons	2,964 0 0
W. J. Botterill	2,309 0 0
Robins	2,100 0 0

For alterations and additions to the parish church, Henry's Mote, Pembrokeshire. Mr. E. H. Lingen-Barker, architect:—

Edwards, Milford	£488 0 0
Jones, Haverfordwest	477 0 0
Lewis, Letterston (accepted)	335 0 0

For Coxheath Union Chapel, Maidstone. Mr. Henry A. Cheers, architect, Bagshot:—

H. R. Swain, London	£2,160	0	0
W. & H. Castle, London	2,100	0	0
S. Wood, Weybridge	1,968	0	0
R. G. Battley, London	1,887	0	0
C. J. Slade, Maidstone	1,861	0	0
J. Higgs, London	1,837	0	0
J. Wood & Son, Maidstone	1,683	0	0
E. Wilkins, Maidstone (accepted)	1,658	0	0

For rebuilding warehouses, 65, City-road:—

Nightingale	£3,661	0	0
Woodward	3,292	0	0
Burman	2,897	0	0
J. H. Johnson	2,683	0	0

For rebuilding Beaumont Arms, and six cottages, Stepney:—

Lawrence	£3,643	0	0
Morter	3,530	0	0
Downs	3,481	0	0
Outhwaite	3,344	0	0
J. H. Johnson	2,993	0	0

For proposed premises, Old Bethnal Green-road, for Mr. John Ramsey:—

Lister	£3,480	0	0
Shurmur	2,750	0	0
Marr	2,700	0	0
Holland	2,601	0	0
Jackson & Todd	2,595	0	0
Forrest	2,586	0	0
Thomerson	2,545	0	0
J. H. Johnson	2,491	0	0
Beale	2,365	0	0

Accepted for granite, &c., Deal. Mr. A. Dryland, Borough Surveyor:—
A. & F. Mannuelle, 59, Mark-lane:—

	Per Ton.
500 tons 1½-in. broken Guernsey granite	11s. 10d.
100 tons ¾-in. Guernsey granite siftings	9s. 5d.

All delivered on the beach at Deal.
J. S. Gabriel, Maidstone, and Grellier's Wharf, Belvedere-road:—
2,400 cube yards broken Kentish rag, at 10s. 5d. per cubic yard, delivered in trucks at Deal Station.

For converting two houses into shops, Albany-road, Camberwell, for Mr. W. Lywood. Mr. E. Crosse, 32, Bermondsey-square, architect:—

Everitt, Coburg-road	£145	0	0
Pryor, Peckham-grove	138	0	0
Rayner, Albany-road	130	10	0
Almond, Fort-road, Bermondsey *	117	0	0

* Accepted.

For second portion or additions to the bakery, at Dawes-road, Fulham, for the Albion Bakery Company (Limited). Mr. G. Edwards, architect. Quantities by Mr. Henry Lovegrove:—

Green, Hackney	£1,557	0	0
Martin, Wells & Co., Aldershott	1,550	0	0
Goad, Camberwell	1,547	0	0
Stimpson & Co., Brompton	1,546	0	0
Tarrant, New Kent-road	1,545	0	0
Scharien & Williams, South Kensington	1,491	0	0

For rain-water sewers for Chatham and Luton, for the Chatham Drainage (contract No. 3). Messrs. Gotto & Beezley, engineers:—

W. & J. Botterill	£6,641	0	0
J. W. & J. Neave	5,989	0	0
J. Smith, Chelsea	5,770	0	0
Wilkes & Co.	5,595	0	0
G. Smith, Newcastle	5,542	0	0
Beadle Bros.	5,450	0	0
W. & T. Denne	5,379	0	0
Ford & Everett	5,225	0	0
J. Dickson	5,178	0	0
R. Nicholson	4,964	0	0
J. Thompson	4,875	0	0
J. C. Trueman (accepted)	4,679	0	0

For fitting up of dairy at Hackney, for Mr. Strong. Mr. Walter Stair, architect, 9, Queen Victoria-street:—

Bartram	£364	0	0
Wilmott (accepted)	325	0	0
Steel Bros.	299	0	0

For alterations and repairs to Nos. 103 and 107, London Wall. Mr. Walter Stair, 9, Queen Victoria-street, architect:—

Richardson Bros.	£425	0	0
Hindle	370	0	0

For Messrs. Edwards & Ringer's premises, Redcliff-street, Bristol. Mr. H. Crisp and Mr. H. C. M. Hirst, architects. Quantities supplied:—

Walters & Son	£12,033	0	0
Belmont	11,966	0	0
Wilkins & Son	11,932	0	0
Brock & Bruce	11,450	0	0
Humphries	11,360	0	0
Crocker	11,005	0	0
Forse	11,000	0	0
Davis	10,945	0	0
Howell & Son	10,884	0	0
Stephens & Bastow, Bristol and London (accepted)	10,873	12	6

For alterations and additions to All Souls' Schools, Marylebone. Mr. Alfred R. Pite, architect, Bloomsbury-square:—

Hayward & Son	£1,533	0	0
Patman & Fotheringham	1,473	0	0
Cowland & Co.	1,448	0	0
Falkner	1,293	0	0
Smith & Sons	1,267	0	0
Hooper	1,255	0	0

For alterations and additions to the parish church, Churt, Farnham. Mr. E. H. Lingen-Barker, architect:—

Diamond, Farnham	£952	0	0
Birch & Co., Farnham	935	0	0
Goddard & Sons, Farnham (accepted)	892	0	0

Alterations at the "Berwick Arms," Castle-street.—In the list of tenders for this job (see *Builder*, July 21, p. 99), Messrs. Puzey & Lumley were mentioned as having submitted the lowest tender. Messrs. Puzey & Lumley having written to say that they did not tender, we find, on inquiry, that by a clerical error their firm was mentioned instead of Mr. R. Priestley, whose tender was the lowest.

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